

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL.,	:	
	:	
PLAINTIFFS,	:	
vs.	:	DOCKET NUMBER
	:	1:17-CV-2989-AT
BRAD RAFFENSPERGER, ET AL.,	:	
	:	
DEFENDANTS.	:	

TRANSCRIPT OF HEARING ON PRELIMINARY INJUNCTION VIA ZOOM

PROCEEDINGS

BEFORE THE HONORABLE AMY TOTENBERG

UNITED STATES DISTRICT JUDGE

SEPTEMBER 10, 2020

1:00 P.M.

VOLUME 1

REDACTED

MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED

TRANSCRIPT PRODUCED BY:

OFFICIAL COURT REPORTER:	SHANNON R. WELCH, RMR, CRR
	2394 UNITED STATES COURTHOUSE
	75 TED TURNER DRIVE, SOUTHWEST
	ATLANTA, GEORGIA 30303
	(404) 215-1383

UNITED STATES DISTRICT COURT
OFFICIAL CERTIFIED TRANSCRIPT

A P P E A R A N C E S O F C O U N S E L

**FOR THE PLAINTIFFS DONNA CURLING, DONNA PRICE, JEFFREY
SCHOENBERG:**

DAVID D. CROSS
VERONICA ASCARRUNZ
EILEEN BROGAN
MORRISON & FOERSTER, LLP

HALSEY G. KNAPP, JR.
ADAM M. SPARKS
KREVOLIN & HORST, LLC

**FOR THE PLAINTIFFS COALITION FOR GOOD GOVERNANCE, LAURA DIGGES,
WILLIAM DIGGES, III, AND RICARDO DAVIS:**

BRUCE BROWN
BRUCE P. BROWN LAW

ROBERT ALEXANDER McGUIRE, III (VIA VIDEO CONFERENCE)
ROBERT McGUIRE LAW FIRM

FOR THE STATE OF GEORGIA DEFENDANTS:

VINCENT ROBERT RUSSO, JR.
CAREY A. MILLER
ROBBINS ROSS ALLOY BELINFANTE LITTLEFIELD, LLC

BRYAN P. TYSON
BRYAN JACATOUT
DIANE LAROSS
LOREE ANNE PARADISE
TAYLOR ENGLISH DUMA

(...cont'd....)

1 (...cont'd....)

2 **FOR THE FULTON COUNTY DEFENDANTS:**

3 CHERYL RINGER
4 KAYE BURWELL
5 OFFICE OF THE FULTON COUNTY ATTORNEY
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1	<u>I N D E X T O P R O C E E D I N G S</u>	
2		<u>PAGE</u>
3	OPENING STATEMENT	
4	by Mr. Cross	22
5	by Mr. Brown	27
6	by Mr. Tyson	30
7	<u>WITNESS</u>	<u>PAGE</u>
8	PHILIP B. STARK, Ph.D.	
9	Direct Examination	
10	By Mr. Brown	40
11	Cross-Examination	
12	By Mr. Miller	56
13	Redirect Examination	
14	By Mr. Brown	81
15	Examination	
16	By The Court	82
17	J. ALEX HALDERMAN, Ph.D.	
18	Direct Examination	
19	By Ms. Ascarrunz	86
20	HARRI HURSTI	
21	Direct Examination	
22	By Mr. McGuire	117
23	Cross-Examination	
24	By Mr. Tyson	144
25	Redirect Examination	
26	By Mr. McGuire	162
27	Recross-Examination	
28	By Mr. Tyson	165
29	Examination	
30	By The Court	166
31	Redirect Examination (Further)	
32	By Mr. McGuire	168
33	Recross-Examination (Further)	
34	By Mr. Tyson	169
35	JEANNE DUFORT	
36	Direct Examination	
37	By Mr. Brown	170

1 (...cont'd...)

2 **WITNESS**

PAGE

3 Cross-Examination

4 By Mr. Russo

185

5 Examination

6 By The Court

189

7 Redirect Examination

8 By Mr. Brown

191

9 * * *

10 CERTIFICATE

209

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; September 10, 2020.)

COURTROOM DEPUTY CLERK: Okay. Good afternoon, everyone. We are here for the evidentiary hearing in Curling vs. Raffensperger, Civil Action Number 17-CV-2989.

Beginning with Curling plaintiffs, would counsel make your appearance for the record.

COURT REPORTER: You are muted, Mr. Cross.

COURTROOM DEPUTY CLERK: Yeah. It is on his side, too.

(There was a brief pause in the proceedings.)

MR. CROSS: Your Honor, can you hear me now?

THE COURT: Yes, I can. Thank you.

MR. CROSS: Sorry about that. We'll try this again. David Cross on behalf of Curling plaintiffs.

THE COURT: Okay.

COURTROOM DEPUTY CLERK: Anyone else?

MR. KNAPP: Your Honor, Halsey Knapp and Adam Sparks also on behalf of Curling plaintiffs.

COURTROOM DEPUTY CLERK: Thank you, sir.

Coalition?

MR. BROWN: Bruce Brown for the Coalition plaintiffs and Robert McGuire also for the Coalition.

COURTROOM DEPUTY CLERK: Thank you, sir.

State of Georgia?

1 MR. TYSON: Your Honor, Bryan Tyson, Bryan Jacoutot,
2 Loree Anne Paradise, and I believe Diane LaRoss are all here
3 for State defendants from Taylor English.

4 COURTROOM DEPUTY CLERK: Thank you, Mr. Tyson.
5 Fulton County?

6 Okay. We're ready, Judge. Thank you.

7 MS. RINGER: Cheryl Ringer and Kaye Burwell here for
8 Fulton County.

9 THE COURT: Thank you very much.

10 MR. CROSS: Your Honor, I should have introduced two
11 other colleagues who are going to participate, Veronica
12 Ascarrunz and Eileen Brogan. We are spread out in the room.
13 So they won't be on the video. But they are here.

14 THE COURT: All right. Very good. And I guess we
15 have pictures of some other people. But that is fine. That
16 doesn't interfere with anything else. And cartoon images of
17 some people. But that is great.

18 So good afternoon, everybody. Before we really begin
19 this in earnest, I know there was some email exchanges late
20 this morning about timing and schedules. And I tried to just
21 sort of cut to the quick of it by having Ms. Cole write you
22 about, you know, basically pick a number of hours that you are
23 basically thinking you can get your case put in, let's monitor
24 that. Because the defendants never agreed to basically a shock
25 top per witness. And I didn't pursue that further at that

1 juncture because we had a lot on our hands.

2 But having a time frame for each side allows us to at
3 least determine how you are doing and having the totality of
4 the time be counted so that we can get this done in a
5 reasonable way this afternoon and starting tomorrow.

6 First of all, did you agree on a time to begin that
7 will accommodate whatever -- whoever's witness was providing
8 some problems in the morning as to schedule?

9 MR. RUSSO: Mr. Miller can speak to that.

10 MR. MILLER: Morning, Your Honor. I apologize.
11 We're having a little logistical difficulties here with our
12 Zoom technology.

13 THE COURT: All right. So this is Mr. Miller
14 speaking for the record, even though it says Vincent Russo, for
15 Ms. Welch's behalf. So if you-all are jumping sides, maybe
16 each time you converse, say your name for the purposes of the
17 record so we make sure that -- Ms. Welch is handling a lot.
18 All right?

19 MR. MILLER: Yes, Your Honor. We'll -- assuming we
20 can get my laptop working, I'll join separately as well. But I
21 didn't want to delay anything right now.

22 THE COURT: Sure. Thank you.

23 MR. MILLER: Your Honor, I think in terms of
24 schedule, yeah, I think we're largely on the same page. There
25 are a couple of outstanding questions from our perspective on

1 schedule as far as, Number 1, Mr. Liu's testimony, who we
2 understand the plaintiffs intend to call but, to my knowledge,
3 has not been noticed as a witness to the Court and,
4 secondarily, with respect to Dr. Coomer, who the State
5 defendants intend to call and for whom there is no effective
6 subpoena sitting right now for his testimony otherwise.

7 So with that respect, our proposal was -- and some of
8 this depends a little bit on -- and Mr. Cross can speak to this
9 as far as Mr. Liu's availability. But looking at it the way we
10 just kind of framed out, assuming an hour per witness in total,
11 not intending that necessarily to be binding but trying to
12 sketch this out so we can inform our witnesses, it appears to
13 make sense, if Mr. Liu is available and plaintiffs intend to
14 call him, if he could be called this afternoon.

15 Other than that, the kind of witness availability
16 time frames I think are consistent with the proposed schedule.
17 And to the extent Mr. Liu is not available today and the Court
18 is inclined to hear his testimony, then perhaps he could go in
19 the morning alongside Dr. Gilbert.

20 Those are kind of the two availability issues as far
21 as witness scheduling.

22 THE COURT: All right. Does -- Mr. Cross, does
23 Mr. Liu have any limitations as to his availability?

24 MR. CROSS: He does, Your Honor. Unfortunately, he
25 is not available today. He is available tomorrow morning. He

1 is in California. So he will start early tomorrow.

2 THE COURT: All right.

3 MR. CROSS: Our thought was get him up tomorrow
4 morning after Dr. Gilbert. Because I understand Dr. Gilbert
5 has a window of time tomorrow morning before 11:00. So if he
6 goes first, we'll finish him. We'll get to Mr. Liu. He will
7 be very short, ten minutes.

8 With respect to Mr. Coomer, we have confirmed with
9 Dominion's counsel he is available today. I'm not quite sure
10 the point about an effective subpoena. I think what Mr. Miller
11 is getting at is in fairness to them we did neglect to send
12 them a copy of a notice of his subpoena.

13 But we originally subpoenaed a 30(b)(6) witness from
14 Dominion. They objected to that. And so we said, well, can we
15 just sub out Mr. Coomer for that? They agreed, and they agreed
16 to accept service, which I know Mr. Miller was aware that we
17 were withdrawing the 30(b)(6) subpoena.

18 So I don't think there is prejudice to them.
19 Mr. Coomer is obviously a big part of the case. We want to
20 examine him. He is available today.

21 The last point, Your Honor, is it is just a matter of
22 timing. If we don't put Mr. Coomer on today, tomorrow is going
23 to get tight. Mr. Coomer is a much more substantive
24 examination than Mr. Liu. We're just going to run out of
25 witnesses today based on availability, particularly because

1 we're leaving a lot of our witnesses until their case, like
2 Mr. Harvey and others who work for the State. And so I think
3 to get it done we need to get Mr. Coomer on today.

4 THE COURT: All right.

5 MR. MILLER: Your Honor, I apologize. I didn't mean
6 to interrupt.

7 THE COURT: That's all right.

8 MR. MILLER: I think in terms of, you know, tomorrow
9 being crammed, I frankly think Mr. Cross is exactly right. We
10 have in front of us a witness list that exceeds what we did
11 last year. And, frankly, you know, to the extent that the
12 parties are aware of concepts, we certainly understand that.
13 But the focus of the Court and having a witness list was so
14 that we could have some form of preparation and logistical
15 scheduling, I would assume, in terms of approach today.

16 We kind of are truthfully a little curious as to what
17 relevance Mr. Liu's testimony is going to have at all.
18 Obviously, the plaintiffs can, you know, call witnesses they
19 believe are going to put on their case. But it seems to me his
20 testimony may just be superfluous in general.

21 At the end of the day Your Honor, the concept on --
22 and I do want to clarify a couple of things as far as -- and I
23 don't believe Mr. Cross is trying to mislead. But in terms of
24 they, the way it was used in the sense of accepting service,
25 that was not the State. That was Dominion.

1 THE COURT: Yeah. I understood that.

2 MR. MILLER: So I did want to clarify that. And the
3 reality is a rule does require prior notice of a subpoena. And
4 if the plaintiffs want to have Dr. Coomer to testify, you know,
5 we certainly understand it. He is already being called as a
6 State's witness. The plaintiffs will have an opportunity to
7 cross-examine him.

8 And I think in terms of practicality, it makes a lot
9 of sense to move forward in the proposed schedule that we sent
10 the Court, which we believe is eminently reasonable in light of
11 the condensed nature of this hearing.

12 THE COURT: Well, I don't really have a schedule,
13 frankly, from you that is in order that I considered reliable.
14 I just had witnesses originally. So I never treated it as if
15 what you sent me was a -- because you-all were having such
16 difficulties in agreeing on things and agreeing also about the
17 most -- you know, the beginning fundamental issue that the
18 plaintiffs' counsel wanted to be able to go beyond the scope of
19 cross so that they wouldn't have to call a witness twice so
20 that I just, you know -- I figured you basically did not have
21 an agreement, that they were calling your witnesses and you
22 were going to then just reserve your examination until later.

23 MR. MILLER: And, Your Honor, I apologize. In terms
24 of the proposed schedule, I'm referring to the Word document I
25 sent Ms. Cole and Mr. Martin this morning and not to the

1 parties' separate witness list.

2 That proposed schedule, I think, takes into account
3 the availability and the witnesses that were called. And Your
4 Honor is correct that our position is, frankly, that
5 cross-examination should be subject to the scope of the direct;
6 alternatively, if cross-examination is subject and direct is
7 subject to the scope of the declarations, which is how we
8 proceeded last year in this case, such that essentially expert
9 declarations were treated as their report.

10 THE COURT: Well, sort of. Yeah. I wouldn't -- I
11 wouldn't say it was that limited though, frankly. But I'm --

12 MR. CROSS: Your Honor, I may be able to help. I
13 think the only real issues on the table are when does
14 Mr. Coomer get called. As a practical matter, he is available
15 today. They are going to examine him. They have always been
16 prepared to examine him.

17 So I'm not sure -- there is no prejudice from us
18 deciding to examine him as well, even though we didn't serve
19 the notice of subpoena. And I apologize for that. But there
20 is no prejudice because they were always calling him.

21 As a practical matter, let's put him up today, free
22 the man up to get back to his life. I have not heard any
23 argument as to why that has prejudiced anyone.

24 As to Mr. Liu, we may end up not needing to call him.
25 We are going to see how Dr. Halderman goes and the other

1 experts. We're going to see what Dr. Gilbert has to say, and
2 maybe we won't call him. But he is ten minutes. So I think we
3 can --

4 THE COURT: All right. Well, you can reserve the
5 time for him. I know that the highest -- the State, I assume,
6 they just want to make sure they have enough time for their
7 witnesses. So I don't have any problem with allowing it a
8 little bit of out of order.

9 But if the State would prefer to have you finish your
10 witness first, that is okay also. But I know that the State
11 has the 11:00 hard and fast time line. So that is really --
12 one or the other is fine with me. We can get them both done by
13 11:00. And we'll begin as we need to in order to do that. And
14 I'm happy to accommodate the State tomorrow morning in either
15 order.

16 MR. MILLER: Thank you, Your Honor. And just in
17 terms of the substantive aspects of Dr. Coomer -- Mr. Cross'
18 statement may get rid of the issue. But in terms of what
19 Mr. Liu is intending to testify about, those may be some items
20 that, frankly, we'll want to direct Dr. Coomer in terms of
21 response. I truly don't know as far as Mr. Liu. But that is
22 sort of the issue as to why we reserved it. But thank you.

23 THE COURT: As to Dr. Coomer, the State has him up at
24 December -- September 11, even though it says December. And I
25 was looking at that. Thank God, you have got me here forever.

1 But you have him at 2:00.

2 But my understanding was that they wanted to limit
3 Mr. Coomer -- Dr. Coomer in terms of the cross-examination.
4 And if that is the State's position, then we just have to -- he
5 will just have to come and testify twice. So it is one or the
6 other.

7 MR. MILLER: Okay. I think I understand Your Honor's
8 point there. And if it is a matter of Dr. Coomer testifying
9 tomorrow and having a scope difference as to Dr. Coomer, then I
10 think that is suitable.

11 THE COURT: Is that acceptable, Mr. Cross?

12 MR. CROSS: I don't want to be difficult, but I'm
13 worried about time, Your Honor, because --

14 THE COURT: Because you are so backed up?

15 MR. CROSS: Yeah. I mean, like -- as Mr. Miller has
16 pointed out, they won't start most of their witnesses until
17 probably late tomorrow morning. Dr. Gilbert will go early.
18 We're taking him out of order.

19 THE COURT: All right. Well, why don't you do this.
20 Why don't we do this then. I want -- you know, it would be
21 very different if we were in person. But I assume that
22 Dr. Coomer is testifying from wherever he is located.

23 So we are in a situation where it probably doesn't
24 make that much difference. He will have to testify twice. We
25 will get it done, and we won't be frozen. And it is my

1 accommodation to you and yet getting also -- I think people
2 will really need the time tomorrow.

3 So I can't tell you we'll end up having an hour break
4 if we're -- either. So all right. So you can call Coomer
5 today. And I guess the extent -- I just will say to you though
6 then don't go over the same subject matter again and again
7 tomorrow. I'm going to hold you to that.

8 MR. MILLER: Sure. Yes, Your Honor. It may well be
9 the case that --

10 THE COURT: I meant Mr. Cross. Maybe you'll have
11 something you want to do and you will say we can get rid of the
12 whole thing yourself today, Mr. Miller. If that is -- you can,
13 that is great too.

14 MR. MILLER: Okay. Thank you.

15 THE COURT: But if you can't, I realize it is your --
16 he is your witness too. And you can reserve it until the next
17 day.

18 MR. MILLER: Thank you, Your Honor.

19 THE COURT: All right.

20 COURTROOM DEPUTY CLERK: Mr. Osophski (phonetic) and
21 Mr. Strickland, please turn your video off.

22 THE COURT: You can still see us by video. We're
23 just trying not to get distracted by seeing you. Thank you
24 very much.

25 COURT REPORTER: Judge, one second.

1 Mr. Cross, could I get you to speak up.

2 MR. MILLER: Your Honor, if I may, I think just in
3 terms of logistics before we kick off with opening statements,
4 there were a couple of additional things in the proposed
5 schedule that I don't know that we necessarily -- we have a
6 time issue that we have all recognized.

7 Our suggestion was to limit direct examination to not
8 exceed 30 minutes. And that was based off of the anticipated
9 time for testimony from the final witness lists that were
10 provided to the Court and then, secondarily, that the time
11 period for cross-examination would not exceed whatever time
12 period for direct, consistent with the Court's docket entry
13 order from late August.

14 You know, frankly, those matters were in the Court's
15 purview. From the defendants' perspective, we thought they
16 made sense in trying to efficiently get through this hearing.
17 But I wanted to raise those two issues.

18 THE COURT: Mr. Cross, do you agree with that?

19 MR. CROSS: No, Your Honor. On the 30 minutes, I
20 don't think there is any witness we anticipate to go beyond 30
21 minutes -- not by much. So I think as an aspiration that is
22 fine. I just don't want to be in a position where we are cut
23 off. But I think all of our witnesses will be around there or
24 less.

25 The second point is really unworkable because, again,

1 we have agreed to forgo witnesses we would affirmatively call
2 to their case, like Mr. Harvey, Mr. Cobb. And so if our cross
3 is limited to the scope of their direct and in limited time, it
4 puts them in a position to do a five-minute direct and we can't
5 do what we would do if we were calling them ourselves.

6 So we are either in one of two worlds. Either their
7 witnesses testify twice, we do an unbounded adverse examination
8 in our case, or they testify once -- which we're comfortable
9 with. That is the most efficient -- and our cross is not bound
10 by the time that they take. That would seem to be the most
11 prudent course.

12 THE COURT: So did you-all come -- when Mr. Miller
13 sent this proposed schedule, had you agreed that -- for
14 instance, for Mr. Harvey that you would be able to exceed the
15 scope of the direct?

16 MR. CROSS: Candidly, Your Honor, I thought we had
17 worked that out yesterday. I misunderstood because we got
18 Mr. Miller's email and he indicated this was still their
19 position.

20 But we have agreed for several days that we would
21 forgo State employees, people they were calling, like their
22 experts -- we would forgo them until their case. And so I just
23 don't think you can reconcile that with the position that we
24 are then bound by the time they use on their direct for our
25 cross. It lets them game that. They can put on whatever

1 testimony --

2 THE COURT: Maybe -- maybe Mr. Miller doesn't mean
3 that.

4 MR. MILLER: In fairness --

5 MR. CROSS: Fair enough. But the bottom point --
6 gaming is not the word. The point is: If they decide they
7 only need five minutes with their witness, then we only get
8 five minutes.

9 THE COURT: I understand the point. I'm just trying
10 to find out what Mr. Miller and Mr. Tyson had in mind because
11 you-all have said now very different things. I tried to broker
12 this, you know, more than a week ago. And I keep on getting
13 different versions of things from you-all now.

14 MR. MILLER: Your Honor, I think in terms of marrying
15 the two together, the time period on direct versus cross, I
16 would suggest that perhaps that is just a default rule of
17 proceeding. And, of course, Your Honor can adjust that on an
18 ad hoc basis as things move forward.

19 Kind of separate issue -- and frankly, Your Honor, in
20 terms of the proposal, we're intending to reflect what we
21 understood the Court anticipated. If that is not what the
22 Court anticipated, then ultimately it is Your Honor's decision.

23 The secondary issue in terms of scope -- we
24 understand that, you know, the limitations we have on trying to
25 put together this quick hearing. I guess the State's concern

1 is that, frankly, we are putting up witnesses on
2 cross-examination on matters that we have no concept as to
3 where the plaintiffs are headed. If they want to take them on
4 direct, that is fine. But there is a high likelihood, it seems
5 to us, that there will be questions that probably are outside
6 of the witnesses' competence.

7 So the suggestion would be that the scope aspect be
8 tied either to the declaration or to the direct. And to
9 Mr. Cross' point, you know, to the extent we have a short
10 direct examination, we certainly would not intend to hold
11 Mr. Cross to a five-minute cross-examination because we are
12 trying to game the system on a five-minute direct.

13 That is not our intent. And I believe Your Honor
14 would call us on that fairly quickly. And Mr. Cross would as
15 well.

16 THE COURT: All right. This is what I'm going to do.
17 You-all wanted to have opening remarks. You can go ahead. I
18 think that originally the plaintiffs wanted to call some of the
19 State employees as witnesses as part of their case and said it
20 would be more efficient that way. You wanted -- then basically
21 you wanted to do it instead.

22 I'm not going to limit them since they said right
23 from the start they wanted to call them as part of their case.
24 If you-all want to change your mind about that, we can take a
25 break and talk about it. Then the plaintiffs can go, and you

1 can call them again.

2 This is what we did before. And I'm just sort of --
3 that was -- so that is how we're going to proceed at this
4 juncture. If it ends up -- I would say when we take a break
5 you-all should chat about it some more. Otherwise, I'll just
6 let the plaintiffs go beyond the scope of the direct. Because
7 I mean, that is what their original intent was to call these
8 folks. I don't think that they are going to be wide-ranging.

9 We are going -- I know we have down here a time of
10 6:00 P.M. for still calling a witness on tomorrow. So it is
11 important that we go as much as possible -- if we run out of
12 witnesses today and we have plenty of time, which would be
13 remarkable, then I'm going to ask them if there is really no
14 reason for the plaintiff not to perhaps call someone like
15 Mr. Harvey who is -- who is pretty straightforwardly factual in
16 my experience with him.

17 But -- but if the defendants object, we'll start
18 earlier on tomorrow. That's all.

19 All right. You-all wanted to make some remarks
20 first. So let's go ahead and do that.

21 MR. CROSS: Thank you, Your Honor.

22 THE COURT: And I will indicate it is essentially
23 1:30, 1:29. So ten minutes of remarks from each side.

24 And I understood that the plaintiffs were going to
25 divide their time or else allocate it to one counsel or

1 another.

2 MR. BROWN: That's correct.

3 MR. CROSS: Yes, Your Honor. I'm going to go first
4 and then hand it off.

5 COURTROOM DEPUTY CLERK: Please turn your video off
6 unless you are counsel of record, please. Thank you.

7 MR. CROSS: Ready, Your Honor?

8 THE COURT: I think we just have -- is it Sue
9 Ellen -- yes -- and Shelley. I guess some of these -- it is
10 hard to tell who is counsel of record and who is here. Some of
11 these people -- that is fine. It is fine.

12 Go ahead. But, please, if you are not counsel of
13 record, be sure to just be appearing as a name and if you want
14 a picture. But that is it.

15 Go ahead.

16 OPENING STATEMENT

17 MR. CROSS: Thank you, Your Honor. I'm going to just
18 briefly touch on three key points to frame the hearing for Your
19 Honor and what I think is the focus as we go through the next
20 couple of days.

21 Let me start with the law because there is a
22 fundamental disagreement in this case about the legal standard
23 Your Honor is to apply. Our position is that unconstitutional
24 elections are never permissible ever. The State fundamentally
25 disagrees.

1 In their papers, they say that an unconstitutional
2 election can be permitted if it is simply inconvenient, too
3 burdensome, or too late to remedy that. We think that is
4 wrong. The Supreme Court has never held that in any case. And
5 we can't imagine it ever would. But the Supreme Court has
6 repeatedly emphasized that the Constitution protects not just
7 the right to vote but to have their votes counted. And that is
8 the issue that we're focused on in this case.

9 It has also emphasized that other rights, even though
10 it is basic, are illusory if the right to vote is undermined.
11 Not eliminated. Not abolished. Simply undermined. And we're
12 going to show you in this hearing that the right to vote in
13 Georgia and to have it counted is undermined.

14 Let me just focus on two quick points, Your Honor.
15 Feasibility -- and I'll start there.

16 Can we get the first slide up?

17 So let me pause for a moment, Your Honor. The State
18 would have Your Honor believe that what we're asking for is a
19 whole new system -- fundamental change in the election system.
20 That is very, very far from reality.

21 What you are looking at here is a picture of the
22 equipment we got from Fulton County. So this is actual Georgia
23 election equipment. And there are three basic components to
24 the BMD system. There is the BMD that you can see, the
25 touchscreen. There is the printer, which is off the shelf.

1 And there is a scanner.

2 What are we asking Your Honor to order? Look, that
3 is it. Eliminate two pieces of equipment. And I'm going to
4 explain this. That is all we're asking. Take the tens of
5 thousands of BMDs which are unreliable, that are vulnerable in
6 ways we will show, glitchy in the printers, and just leave them
7 where they are but keep the rest of the system. Keep the
8 scanners. Keep the EMS. Keep the poll workers who are trained
9 on paper ballots, so on and so forth.

10 How do we know that you can do this with the existing
11 system? Let me be clear. This isn't 2018 where we were
12 changing the GEMS system. This isn't 2019 when they were first
13 rolling out the BMDs. This is take the existing system and the
14 training and use hand-marked paper ballots.

15 Here is how we know that they can do it. Next slide.
16 This is the emergency paper ballot plan that the State has sent
17 out. And I'm going to focus you quickly on a couple of
18 provisions. So let me blow up the first one.

19 What this provides is that under a variety of
20 circumstances the State is supposed to use or the counties are
21 supposed to used hand-marked paper ballots. And that can be if
22 there are too few machines, the machines don't work, wait times
23 are too long, longer than 30 minutes.

24 Think about June. These circumstances happened all
25 across the counties in ways even worse than we first imagined

1 based on the discovery we have gotten. And we'll show you
2 this.

3 And we know that it is going to be worse in November
4 with a much bigger turnout. So they are going to have to have
5 lots and lots of hand-marked paper ballots, paper ballots to be
6 marked by hand.

7 How do those get tabulated? Exactly like the BMD
8 ballots. This is the key. The first bullet, we're talking
9 about marking ballots by pen at the polls. What happens?
10 Those get scanned in to the same Dominion scanners right there
11 in the precinct exactly in the same manner as the BMD
12 ballots -- in the same manner.

13 So the only change we're talking about is when the
14 voter walks in, instead of having them deal with a bunch of
15 equipment, instead of having the counties set up a bunch of
16 equipment, simply hand the voter a paper ballot and a pen. And
17 from there, everything happens the same.

18 Let me just briefly finish on security, Your Honor,
19 because what we're going to show you is the reason this simple
20 solution is necessary is because we have got a voting system
21 that's fundamentally unsecure.

22 Next slide. First, Your Honor, they have not offered
23 a single election security expert to endorse Georgia's BMD
24 system. They could not find one. They haven't even allowed
25 their experts to examine that system. Dr. Gilbert has never

1 used it.

2 Next, Your Honor, we're going to show you that the
3 BMD system is readily hackable in similar, if not worse, ways
4 than the DRE system Your Honor already found unconstitutional.
5 Dr. Halderman and others are going to show that to you
6 firsthand.

7 We also know next that of the many security
8 vulnerabilities that Fortalice found years ago most of those
9 are still out there in the system unremediated. And despite
10 Your Honor's directive for them to work with their consultant
11 on that, they have done nothing in two years.

12 We also now know -- next point -- evidence confirms
13 that we now have there is, in fact, connectivity between the
14 old system and the new that allows the spread of malware.

15 Lastly, Your Honor, they are going to say audits.
16 They are going to tell you that audits are the superman of
17 election integrity to save the day. Not in Georgia.

18 First of all, Your Honor, Dr. Gilbert himself is
19 going to admit -- he was forced to admit in his declaration --
20 that very few voters, a study he himself cites Your Honor to --
21 very few voters even examine their ballots. And among those
22 who do, they routinely do not miss errors and anomalies.

23 And, in fact, although Dr. Gilbert spent a lot of his
24 declaration a year ago talking about audit procedures and how
25 he thought that they would work out well in Georgia, his latest

1 declaration says he is offering no opinions on the audit
2 procedures in Georgia. The man wouldn't even address it for
3 Your Honor this time around now that we have some proposed
4 rules. And it is no surprise because Georgia has no reliable
5 RLA procedures, which he says are critical.

6 In fact, what they have proposed, at least the latest
7 proposal we have seen, is a single RLA for a single election
8 picked by the Secretary of State every other year. Not even
9 close to what Dr. Gilbert says is needed, which is RLAs across
10 the state for every race.

11 So I'm going to hand it off to Mr. Brown, I believe,
12 Your Honor, with this. The solution we are proposing is very
13 simple. It takes the existing infrastructure. It uses that
14 infrastructure and provides constitutional elections for our
15 clients and for voters across the state. And it is not ever
16 permissible to allow an unconstitutional election, and that is
17 what will happen if there is no relief.

18 Thank you, Your Honor.

19 OPENING STATEMENT

20 MR. BROWN: Thank you, Your Honor. Bruce Brown for
21 the Coalition plaintiffs. The upcoming election will be one of
22 the most controversial and chaotic in the nation's history.
23 The question today is whether in the midst of this chaos
24 Georgia will be able to say at the end of the day that it knows
25 who won the election. And this it cannot do with the existing

1 equipment.

2 We will put up Dr. Philip Stark, who is the
3 preeminent expert on election auditing. And he will testify
4 that no quality of audit, no matter how good the audit is, with
5 the existing equipment, Georgia will not have an auditable or
6 accountable election.

7 Your Honor held in 2018 before the State purchased
8 the system that if a new balloting system is to be launched in
9 Georgia it must -- it should address democracy's critical need
10 for transparent, fair, accurate, and verifiable election
11 processes that guarantee each citizen's fundamental right to an
12 accountable vote.

13 And, Your Honor, the question -- the defendants will
14 say there is a lot of -- lot of dispute, that there's facts on
15 both sides, that there is an academic dispute. There is not.
16 Every time you hear the phrase it is just policy preference or
17 there is a factual dispute or all elections are insecure to
18 some degree, that is code for we don't have any evidence to
19 support our position. Because they don't.

20 The evidence and the science and the law is
21 undisputed. All that remains is the noise that you will hear
22 from the defendants, which you will not hear witnesses as
23 Mr. Cross -- you will not hear experts as Mr. Cross explained.

24 You will also hear from Harri Hursti, internationally
25 recognized cybersecurity expert and ethical hacker, who will

1 explain his own observations and his own expertise about in an
2 alarming detail as to the complete absence of the security
3 infrastructure protecting Georgia's election system from either
4 a malicious attack or an innocent programmer.

5 I, of course, would echo Mr. Cross' statements about
6 the simplicity of his solution. But I would also say that what
7 is crippling Georgia now is the complexity of the system. So
8 the proposed solution does two things. It provides an
9 accountable election, which the Constitution guarantees to its
10 citizens. But it also dramatically decreases the complexity
11 that is crippling Georgia right now. And it is unable to show
12 again that not only is it putting forward a vulnerable system
13 but it is institutionally incapable of protecting it in a way
14 that is acceptable to the community.

15 Your Honor, we have two other issues that I will
16 address very quickly. One -- and these are independent of the
17 switch from hand-marked paper ballots. And we'll address this
18 further in the hearing.

19 One is to the extent -- the first is the paper
20 pollbook backups. Separate issues in a separate motion. We
21 believe that is fully briefed and that there are undisputed
22 facts on that. And the State has no good reason for not at
23 this point -- that remedy would have fixed the meltdown in
24 June. And if it is not fixed, we'll have another meltdown in
25 November. As the lines get longer and longer, here is what

1 happens now, Your Honor --

2 THE COURT: Why don't you move on because I certainly
3 read all about this. And I understand. And you-all are at ten
4 minutes. So wrap it up.

5 Is there something else -- do you want to flag the
6 other things?

7 MR. BROWN: The other things is on the scanning, Your
8 Honor. The scanning -- you will hear evidence on that.

9 So thank you very much for your time.

10 THE COURT: You are very welcome.

11 MR. TYSON: Your Honor, I'll be proceeding for the
12 State when you are ready.

13 THE COURT: I'm ready.

14 OPENING STATEMENT

15 MR. TYSON: Thank you, Your Honor. Bryan Tyson for
16 the State defendants. One thing we all agree on is this is a
17 critically important case.

18 The plaintiffs are asking this Court to be the first
19 court in the country to find that a paper ballot election
20 system using ballots marked by ballot-marking devices violates
21 the United States Constitution. And after the plaintiffs ask
22 you to reach that question, they are also asking for relief on
23 any variety of other components in the system, including Poll
24 Pads, scanner thresholds, and audits. But this Court should
25 not grant any relief in its attempt to undermine the public

1 confidence in the legitimacy of Georgia's elections.

2 When this Court denied a third round of preliminary
3 injunction motions last month, it found that the evidence
4 presented was insufficient as a matter of law to determine that
5 the Dominion BMD system was facially unconstitutional. And you
6 left open the question of whether further evidence would
7 support an as-applied challenge. And the Court relied heavily
8 on the intent of the plaintiffs to significantly supplement
9 their evidence.

10 What we're going to see over the next few days is not
11 a significant amount of new evidence. What we're going to see
12 is a series of recycled theories and conjecture using this
13 court as a platform.

14 Indeed, in response to the State defendants'
15 expedited discovery seeking evidence of malware that could
16 alter election outcomes or any evidence of any actual
17 compromise of the prior voting system in Georgia, Curling
18 plaintiffs' entire document production in response was one
19 email from almost a year ago just speculating about a variety
20 of attacks on a system they had not examined.

21 Further, as the briefing demonstrated, the Coalition
22 plaintiffs thought they had uncovered a major problem with the
23 timestamps but instead simply misread the Dominion manuals and
24 didn't understand how Georgia's system actually worked.

25 There simply is not a significant amount of new

1 evidence. Or if there is, the plaintiffs are not letting it be
2 tested through the adversarial process. But I want to begin
3 where the Court must, with the law.

4 For the first prong of a preliminary injunction in
5 this case, under the Anderson-Burdick balancing test, this
6 Court must first find a burden on the right to vote created by
7 the use of Georgia's new electronic voting machine, then
8 categorize the burden from mild to severe if it finds one
9 exists, and then balance the State's interests. The evidence
10 is going to show there is not a burden on the right to vote.

11 The plaintiffs offer a series of theories that are
12 still not backed up by any evidence of any compromise of a
13 component of any part of the system. The plaintiffs are unable
14 to connect any of those dots they are putting on the page. And
15 everything they offer is speculation. But even if they could
16 connect the dots to an actual compromise somewhere, any burden
17 is extremely slight on voters because, unlike the DRE system,
18 voters have the opportunity to verify the ballots that are
19 counted by the scanners and then audited using a risk-limiting
20 audit that Dr. Adida has testified addresses potential QR code
21 errors.

22 And so taking that vanishingly small burden and
23 weighing it against the State interests and clear voter intent
24 and access for disabled voters in the orderly administration of
25 elections, and a timely processing of returns, all those things

1 counsel in favor of finding that the State's interests
2 dramatically outweigh any minute burden on the right to vote if
3 it is even there through the use of BMDs. This Court cannot
4 get to a question of remedy unless the plaintiffs get past that
5 first hurdle, which they cannot.

6 And then moving to the second prong of a preliminary
7 injunction, there is no irreparable harm here. Plaintiffs can
8 go vote a paper ballot marked by hand and deposit it in a
9 dropbox. They cannot have an injury based on the outcome of an
10 election, as the Eleventh Circuit made clear in *Jacobson*, only
11 their own votes being counted.

12 Ultimately, plaintiffs want to vote using a different
13 system in their precinct. That is a policy position they
14 advocated for in the Georgia General Assembly and lost. And
15 now they ask this Court to impose what they could not persuade
16 policymakers was a better system.

17 And then the third and fourth prongs on equities and
18 public interest also favor in denying relief. In this act of
19 this case, the plaintiffs have put forward no evidence from
20 anyone with statewide experience that the remedies they seek
21 are even feasible on the time line that we are on.

22 We have discussed we have more witnesses scheduled
23 for this hearing than any of our prior hearings. But the Court
24 has already found in 2018 that September was too late to make a
25 change. And nothing has changed from that decision. Absentee

1 ballots for November go out next week. Early voting starts
2 October 13. We are on the eve of a November election. We are
3 in the election.

4 Where are the election administrators who said last
5 year that plaintiffs' proposed relief was feasible? They
6 aren't here and for good reason. Because the kinds of relief
7 they are proposing cannot be implemented before or after the
8 November elections.

9 So let's talk a little bit about that relief.
10 Eliminating BMDs for the November election, Mr. Cross says it
11 is very simple, it is very easy, you just take two components
12 out. The Court has already noted that it seems like it is
13 unlikely at this juncture in the case. But during our
14 conversation yesterday, the Court noted the plaintiffs were
15 still sorting through their own issues.

16 And the so far undisputed evidence is there is not
17 enough capacity to preprint and handle millions of additional
18 paper ballots for the November election, let alone deploy all
19 of those ballots and ballot combinations, possibly thousands in
20 some counties, to every early voting site when early voting
21 begins in a little over 30 days.

22 An emergency ballot provision that is for a limited
23 purpose on election day is not a framework under which the
24 State can conduct an election under an entirely hand-marked
25 paper ballot system.

1 The other relief that plaintiffs seek ask the Court
2 to involve itself in the administrative details of an election,
3 which the Eleventh Circuit has said federal courts may not do.
4 Mr. Brown talked about paper pollbook backups. The State
5 already does this. The undisputed evidence is that it is a
6 burden -- a severe burden to print them as requested by the
7 Coalition plaintiffs. There is nothing in response to that in
8 evidence.

9 Scanner thresholds. Even if it was jurisdictionally
10 appropriate for this Court to weigh in, the State considered a
11 variety of options regarding scanners and set rules for the
12 thresholds through regulation. And, again, the undisputed
13 evidence showed that having a human check every stray mark made
14 by a voter who disregards the instructions to fill out their
15 hand-marked ballot properly will lead to delays in
16 certification. And that is a huge issue in a presidential
17 election year.

18 Mr. Cross and Mr. Brown say audits are worthless.
19 The State worked with the national organization, VotingWorks,
20 to design a risk-limiting audit based on models used in other
21 states. Georgia is going to be one of only a handful of states
22 conducting a precertification statewide risk-limiting audit in
23 November 2020.

24 There is absolutely no basis for this Court to order
25 a different process than the one that took almost a year to

1 design. And there is no reason for this Court to intervene in
2 what is ultimately an academic debate about the role and scale
3 of audits, especially to say the U.S. Constitution mandates a
4 particular audit process when it leaves the administration of
5 elections to states.

6 Your Honor, this case is about Georgia's BMDs. This
7 case is about Georgia's scanners. The people of the State of
8 Georgia can and should have confidence in their election
9 system, and this Court should not find otherwise.

10 We can verify our ballots. Georgia will utilize a
11 risk-limiting audit before certifying. This Court should deny
12 plaintiffs' attempts to undermine the legitimacy of Georgia
13 elections by their attacks on election technology,
14 especially -- especially in an emergency motion context.

15 And I want to be very clear about this. The
16 plaintiffs are going to have the chance to make their case.
17 That is how litigation works. But that should not take place
18 on a lower standard rushed schedule like is happening right
19 now.

20 This case has been going on for three years. It
21 started as an election contest in the Karen Handel/John Ossoff
22 race in 2017. Then it was a case challenging DREs. Then it
23 was a case challenging BMDs. And now it is a case challenging
24 BMDs, scanners, and any other piece of election technology
25 plaintiffs can think of.

1 The adversarial process exists for a reason. And
2 this Court should deny plaintiffs' attempt to seek massive
3 changes to Georgia's election system on incomplete, rushed, and
4 untested evidence.

5 Because of the significance of this case, the
6 plaintiffs' claims should be put to that test with experts for
7 each side evaluating what they are saying, not conducting a
8 trial by ambush. After discovery and fair testing, the Court
9 can then rule on their claims at that time.

10 But in the meantime, Your Honor, the Court should
11 deny act four of the preliminary injunction motions and let
12 this case proceed to act five where it can be resolved through
13 the application of the Federal Rules of Evidence and the
14 Federal Rules of Civil Procedure by this Court.

15 Thank you.

16 THE COURT: Thank you.

17 I just want to remind everybody attending the hearing
18 that if you are not counsel of record please eliminate your --
19 the imaging for yourself. You can still watch the video
20 without my seeing you and being distracted or counsel seeing
21 you and being distracted.

22 So there are several people who are right now
23 appearing visually. And I'm trying not to call people out. I
24 don't know all the people who virtually are here present. But
25 I can see that there are many people who are still not

1 controlling your video so that you are not appearing.

2 So all you have to do is cross your -- basically put
3 a strike through the video so you are not appearing. You will
4 still be able to see everything.

5 COURTROOM DEPUTY CLERK: Thank you, Mr. Strickland.

6 Amy C., are you able to disable your video please?

7 Amy C., please turn your video off.

8 THE COURT: You are waving at us now, Amy. So I'm
9 not --

10 UNIDENTIFIED SPEAKER: Maybe they don't know how.
11 Maybe you should instruct --

12 COURTROOM DEPUTY CLERK: I'm going to remove her from
13 the hearing and she can call back in using the audio only line.

14 Okay. It looks like she was able to turn it off.

15 THE COURT: All right. Very good. All right.

16 Thank you for your remarks. A fair amount of heat
17 for opening remarks, let me just say, from all sides. And I
18 know that everyone feels very strongly about this.

19 I want to say one thing though. Having heard this
20 case for some time, I do not think it is an accurate
21 description of the third -- the Court's ruling in the summer
22 not granting the relief on the facial basis to say that we went
23 through a full preliminary injunction hearing.

24 The reality is there was a motion to dismiss, there
25 was a motion for preliminary injunction, there was a facial

1 challenge. I had a hearing, which I basically was asking
2 questions because there were issues I wanted to understand.
3 And it wasn't an independent opportunity for the plaintiffs to
4 present and even at points cross-examine witnesses. And I
5 asked the State to explain to me some issues that I was not
6 clear about from their presentation and from the plaintiffs'
7 presentation. And that was the essence of what occurred.

8 So I want to be clear that I do not -- I do not view
9 that as an evidentiary hearing. I denied it as a facial
10 challenge after looking at it with the additional information
11 made available.

12 Unfortunately because of the pandemic, I felt myself
13 was not able to turn right back to writing about it. And I
14 apologize to you-all for that. And the schedule as it was --
15 that basically got moved later than I would have preferred
16 because of the challenges that we have had this spring.

17 That hearing was held approximately, I think, a week
18 or so before the Court basically stopped -- it continued to
19 hear -- have cases. But it was not able to have hearings. And
20 everyone understands what happened at that juncture.

21 So in my view, that is how -- just in terms of the
22 schedule, a fuller description of what has happened in the last
23 half year and how we got here at this date.

24 All right. It is now 1:55. Do plaintiffs want to
25 call your first witness?

1 MR. BROWN: Thank you, Your Honor. The Coalition
2 plaintiffs will call Dr. Philip Stark.

3 COURTROOM DEPUTY CLERK: If you would, please raise
4 your right hand.

5 **(Witness sworn)**

6 COURTROOM DEPUTY CLERK: All right. Please, sir, if
7 you would state your name and spell your last name for the
8 record.

9 THE WITNESS: Philip Bradford Stark, S-T-A-R-K.

10 Whereupon,

11 PHILIP B. STARK, PH.D.,

12 after having been first duly sworn, testified as follows:

13 DIRECT EXAMINATION

14 BY MR. BROWN:

15 **Q.** Thank you, Dr. Stark. Dr. Stark, this is Bruce Brown
16 representing the Coalition plaintiffs.

17 Can you hear me okay?

18 **A.** Yes, sir.

19 **Q.** Dr. Stark, by whom are you currently employed?

20 **A.** University of California at Berkeley.

21 **Q.** And what do you teach?

22 **A.** I teach statistics.

23 **Q.** And you have submitted a number of declarations in this
24 case; correct?

25 **A.** Yes, sir.

1 Q. I believe in your first one, you included a copy of your
2 CV; correct?

3 A. Yes, sir.

4 MR. BROWN: And just for the record, that is with
5 Document 296, Your Honor.

6 Q. (BY MR. BROWN) And, Dr. Stark, did you invent the
7 risk-limiting audit?

8 A. Yes, I did.

9 Q. Have you testified in court and Government entities about
10 election auditing and election security?

11 A. Yes, sir. On a number of occasions.

12 Q. Now, beyond your expertise in election auditing, I would
13 like to focus your attention on your experience in election
14 security.

15 What experience or expertise do you have with election
16 security?

17 A. Well, I'm on the cybersecurity subcommittee of the
18 Advisory Board of U.S. Election Assistance Commission. I have
19 been on the program committee of two election security
20 conferences for about six years now.

21 I have published 17 or 18 peer-reviewed publications in
22 election security journals and conference proceedings. I have
23 testified to the California Little Hoover Commission about
24 election security.

25 I have advised Secretaries of State in Colorado and

1 California on matters related to election security, as well as
2 the election commissions of Nigeria, Mongolia, and Denmark.

3 I was asked to co-author a manual or report on election
4 forensics for the Venice Commission of the Council of Europe.
5 A number of other things.

6 **Q.** Thank you.

7 MR. BROWN: Your Honor, I would tender Dr. Philip
8 Stark as an expert in the fields of election auditing and
9 election security.

10 THE COURT: Any objection? Is there any objection?

11 MR. MILLER: I apologize. This is Carey Miller. We
12 were unmuting. We are readjusting for our Zoom issues.

13 I -- the State defendants would assert an objection
14 to the extent that the expertise of Dr. Stark is being offered
15 for. It goes beyond the concept of auditing.

16 And if Your Honor would prefer, we can conduct a voir
17 dire at this point or subsequent in our cross-examination.
18 That is perfectly fine too.

19 THE COURT: You can do it later.

20 MR. MILLER: Thank you.

21 **Q. (BY MR. BROWN)** Dr. Stark, have you developed an opinion
22 on whether BMDs, like the BMDs used in Georgia, guarantee a
23 transparent, fair, accurate, and verifiable election?

24 **A.** Yes. They do not.

25 **Q.** And in general terms, why don't they?

1 **A.** Introducing electronics between the voter and the paper
2 record in effect makes the paper record hackable. The machines
3 themselves are vulnerable to misconfiguration, software bugs,
4 and hacking.

5 Evidence is that the vast majority of voters do not notice
6 errors in the BMD printout. Those who do have no mechanism by
7 which they can cry foul and prove to a poll worker or election
8 official or anybody else that there was, in fact, a
9 malfunction, that the ballot-marking device didn't do what it
10 was supposed to do.

11 There is essentially no practical way to detect hacking of
12 ballot-marking devices. And as a result, the paper record
13 produced by ballot-marking devices is not a trustworthy record
14 of voter intent.

15 **Q.** Dr. Stark, you may have heard in the opening that counsel
16 for the State asserted that Georgia was going to do a
17 risk-limiting audit of these elections.

18 And I want to ask you: Would a risk-limiting audit of
19 these elections be effective and, if they are effective, what
20 would they show or not show?

21 **A.** If they were to conduct a genuine risk-limiting audit
22 including a compliance audit to ensure that the chain of
23 custody of the paper hadn't been broken, that the paper trail
24 is as it was when it was cast by the voters, all that a
25 risk-limiting audit could accomplish is to confirm that the

1 whole manual tabulation of the paper record would give the same
2 winner or winners as the electronic tabulation of that paper
3 record did. It would do nothing to detect or correct any
4 problems in the generation of that paper record by the
5 ballot-marking devices.

6 To the extent that ballot-marking devices misprinted
7 voters' intentions, there is nothing that a risk-limiting audit
8 could do to detect that or recover from it.

9 **Q.** Dr. Stark, you mentioned vulnerability. Does your opinion
10 about the efficacy of a risk-limiting audit depend upon the
11 degree of vulnerability that the Court might find that the
12 Georgia system is subjected to?

13 **A.** Unless there were a way to guarantee that every single BMD
14 printout was correct, that it correctly reflected what was
15 shown to the voter on the screen or spoken into the voter over
16 the audio interface, then there is a problem that cannot be
17 rectified by any kind of auditing.

18 So provided they are not perfect, this problem exists.
19 The materiality of the problem is going to depend on the number
20 of voters who vote using ballot-marking devices.

21 **Q.** Dr. Stark, the evidence will show that there is some --
22 there's studies that have been conducted that show that some
23 voters do, in fact, verify their ballots.

24 Why isn't that enough to either be a random kind of
25 sampling or enough to alert officials there might be a problem?

1 **A.** There are several questions wrapped up in that. I'll try
2 to untangle it.

3 So first of all, some voters noticing that there was an
4 error in the printout and requesting a fresh opportunity to
5 mark a ballot does nothing for the voters who didn't check or
6 didn't request a fresh opportunity. So it only corrects those
7 votes where the errors were caught.

8 Secondly, the number of voters who would request a fresh
9 opportunity to mark a ballot may be very, very small.
10 Certainly not enough to arouse suspicion.

11 Conversely, if election officials were willing to take
12 voters' assertions that the device misbehaved as proof that the
13 device misbehaved, the only recourse would be to hold a new
14 election. There is no way to go back and figure out which
15 votes were affected, how many votes were affected, and what the
16 correct outcome of the contest should have been.

17 **Q.** Dr. Stark, is there some kind of pre-election testing
18 though that the State could conduct that would ensure that the
19 BMDs don't misbehave in such a manner?

20 **A.** There is pre-election testing that the State should
21 conduct routinely, logic and accuracy testing. But that
22 testing can generally only detect gross misprogramming errors,
23 gross configuration errors.

24 There is no way that it can suffice to show that on
25 election day the devices do not alter enough votes to change

1 the electoral outcome of one or more contests.

2 **Q.** I also heard the assertion that, you know, a BMD printout
3 is in English, the voter is free to verify it.

4 How can there be question of voter intent if the voter has
5 that opportunity?

6 **A.** Well, again, there's several issues there. BMD, kind of
7 by its nature, erases all direct evidence of voter intent.
8 There's no way to tell from a BMD printout what the voter
9 actually saw on the screen, what the voter did with the device,
10 what the voter heard through the audio interface. So it really
11 becomes trusting the computer at that point.

12 Yes, the ballots are printed in English. Ballots in
13 Georgia, ballots in California are quite long. They typically
14 vote on very many things. I understand that in the primary
15 this summer there were something like 29 issues to vote on in
16 Fulton County, if I'm recalling correctly.

17 The evidence is that most voters don't check, that those
18 who do check often miss problems that are actually there. And
19 I personally would not be able to recall how I voted on 29
20 different things without using a sample ballot or some kind of
21 paper record of what -- how I intended to vote.

22 **Q.** I want to focus your attention on: Of the few voters who
23 might check their ballot and the fewer still who might check --
24 detect an error, if they go to a poll worker, what are the poll
25 workers' options?

1 **A.** Well, in most states -- and I assume in Georgia as well --
2 the poll worker should give the voter a fresh, unmarked ballot
3 to have a do-over, to mark the ballot again, or mark a fresh
4 piece of paper.

5 The -- the poll worker or the election official is really
6 in a bind because there is no way for an election official to
7 tell whether when a voter requests a new opportunity to vote it
8 is because the voter made a mistake, the machine malfunctioned,
9 or the voter is just crying wolf and trying to cast out on the
10 outcome of the election.

11 The fundamental problem with ballot marking or a
12 fundamental problem with ballot-marking devices is that they
13 make voters responsible for the security of the system but
14 don't provide the voters with evidence that the voters can then
15 show anyone else to demonstrate that this was a problem.

16 **Q.** Dr. Stark, have you looked at the issue of how many hacks
17 would be necessary to go detected or undetected in an actual
18 election given some assumptions about the number of voters who
19 might detect that problem?

20 **A.** Yes, sir. I prepared a demonstrative exhibit using as an
21 example the Attorney General's conference -- I'm sorry --
22 contest in Georgia in 2018.

23 MR. BROWN: And at this point, Your Honor, I would
24 like to ask that Dr. Stark's Demonstrative Exhibit Number 1 be
25 shared on the screen.

1 THE COURT: All right. Have you shared it with the
2 defense counsel?

3 MR. BROWN: No, I have not, Your Honor.

4 THE COURT: All right. Well, I'll let you show it.
5 But please have everything else -- anything else that you-all
6 can share in advance, I would appreciate your doing that.

7 MR. BROWN: Thank you, Your Honor.

8 THE COURT: Both sides.

9 MR. BROWN: Can everybody see this exhibit, Your
10 Honor? Can you see that?

11 THE COURT: I am just looking at whether I can get it
12 up larger. That is all. It is all my eyesight.

13 MR. BROWN: Mine too.

14 THE COURT: All right. That is better. Thank you.

15 THE WITNESS: It helps me too.

16 **Q. (BY MR. BROWN)** Dr. Stark, can you tell the Court what
17 Stark Demonstrative Exhibit Number 1 is -- what it shows?

18 **A.** The official results for the Georgia Attorney General
19 contest in 2018, Chris Carr beat Charlie Bailey 51.3 percent to
20 48.7 percent.

21 That margin, the way it is expressed here, is about
22 2.6 percent, which is not especially small as margins go.
23 There were a total of just shy of 4 million ballots cast in all
24 of Georgia of which a little more than ten percent were cast in
25 Fulton County.

1 The table shows various hypothetical situations. In the
2 left column, the left column indicates what fraction of voters
3 cast their mark of their votes using a ballot-marking device.
4 The first three rows are for every voter using a BMD. The next
5 three rows are for half the voters using BMDs. The last three
6 rows are what happens if only five percent of voters use BMDs.

7 Then the next column is the rate at which voters noticed
8 errors and requests a fresh opportunity to mark a ballot. The
9 6.6 percent figure comes from experiments done, a study by
10 Matthew Bernard, Alex Halderman, and others from the University
11 of Michigan. That was the rate that they found which voters
12 would notice errors in their ballots without any prompting.

13 20 percent is an optimistic number. That was a number
14 that that study found through the rate of detection with
15 appropriate verbal prompting of voters to review their ballots
16 just before the voters scanned the printout.

17 And 76 percent is an even more optimistic figure. It
18 comes from a study by Kortum, et al., at Rice University where
19 they found among voters who did review their ballots on average
20 across the experimental conditions that they used 76 percent
21 noticed errors. Though, if you could get every voter to review
22 his or her ballot, the BMD output, then perhaps one might
23 attain a 76 percent rate of noticing errors in the output.

24 The third column is the rate at which votes would need to
25 be altered in order to alter the outcome of that Attorney

1 General contest. So, for example, in the first row, by
2 altering 1.4 percent of BMD printouts, you could change the
3 outcome of that contest.

4 The fourth column is the rate at which voters who used
5 ballot-marking devices would request a new opportunity to mark
6 a ballot on the assumption that they have that detection rate
7 and that hacking rate, that rate of altered votes.

8 And the final column is, if this alteration of votes were
9 uniform across the entire State of Georgia, the number of
10 voters in Fulton County who would request a new opportunity to
11 mark a ballot.

12 **Q.** Dr. Stark, just in your -- the hack rate would be the
13 number of votes that needed to be changed, say, from Bailey to
14 Carr or from Carr to Bailey; correct?

15 **A.** Yes, sir. But only -- I'm assuming that the only votes
16 that get altered are votes that are cast using ballot-marking
17 devices.

18 **Q.** And does your -- do your numbers assume that the voters
19 who cast this mistake -- their votes are switched to be
20 correct?

21 **A.** Yes. I'm assuming that if they catch an error and request
22 a fresh opportunity to vote that second marking of a ballot is
23 not altered.

24 **Q.** So even if the diligent voters who catch this mistake get
25 that fixed, a relatively tiny hack rate could still change the

1 election; correct?

2 **A.** Yes, sir. A relatively low rate of errors in the
3 printout. And that would generate an even lower rate of
4 do-over requests in the polling places.

5 **Q.** I want to focus your attention and on the rows as you go
6 down -- not the columns but the rows.

7 And what do you see as you decrease the percentage of
8 voting systems that are BMDs?

9 **A.** In order to alter the outcome of the contest would then
10 require altering a larger and larger percentage of the
11 BMD-marked paper printouts.

12 So starting -- if everyone votes on a BMD and let's take
13 20 percent as a relatively optimistic figure, which would
14 require specific interventions to attain -- particular ways of
15 reminding voters -- so if everyone voted on a BMD, the do-over
16 rate would be on the order of three voters in a thousand,
17 .3 percent, .003. If only half of the voters voted on BMDs,
18 that would double. It would still be less than a percent. It
19 would be six voters in a thousand.

20 But if you restricted the use of BMDs to a much smaller
21 set of voters, voters who particularly benefit from the
22 accessibility advantages such as AR BMDs, then that do-over
23 rate would rise to 6.4 percent, .64 out of a thousand, among
24 those voters who marked their ballots using ballot-marking
25 devices.

1 MR. MILLER: If I may, I apologize. This is Carey
2 Miller. I'm trying not to interrupt and realizing that we are
3 on a Zoom hearing here. But I don't want to waive any
4 objections.

5 It seems at this point that the demonstrative has
6 gone a little beyond just a demonstrative and is what appears
7 to be an attempt at substantive evidence. They are welcome to
8 bring in Dr. Starks' declaration for which there is no,
9 frankly, discovery as to the basis of the opinion.

10 I understand if Your Honor wants to proceed as a
11 matter of efficiency, but I just wanted to ensure we weren't
12 waiving anything with this being the first witness today.

13 THE COURT: All right. Your objection is noted.

14 MR. BROWN: Thank you, Your Honor.

15 And if we can take this demonstrative exhibit down
16 for now. And we can pull it up on cross if the State has some
17 questions about it.

18 THE WITNESS: I'm sorry.

19 **Q. (BY MR. BROWN)** Dr. Stark, I wanted to change gears a bit.

20 **A.** May I make a clarifying comment?

21 **Q.** Sure. Sorry.

22 **A.** There are calculations of this form in one of my
23 declarations. These specific numbers aren't there. But
24 calculations of the same form are.

25 **Q.** And I believe they are also in the article that you cite

1 in one of your declarations as well?

2 **A.** Yes.

3 **Q.** Now, I want to switch gears. The State will contend that
4 the audit that is being done by the VotingWorks I believe is
5 the name of the application or the company, which Dr. Adida is
6 associated with, will be sufficient to show that the results
7 are verifiable.

8 Now, have you reviewed Dr. Adida's declaration?

9 **A.** Yes, sir.

10 **Q.** And do you believe that Dr. Adida says that, or, if he
11 did, if that were consistent with your opinion?

12 **A.** No, sir, he didn't say that.

13 **Q.** And why -- what do you mean?

14 **A.** What Dr. Adida said was if every voter checks the human
15 readable portion of the ballot and -- and confirms that it
16 correctly reflects that voter's intention and a risk-limiting
17 audit uses the human readable portion of the ballot as the
18 basis for the audit, then errors in the QR code, where the QR
19 code doesn't represent what the human readable portion is,
20 could be detected by an audit.

21 **Q.** And in your view, does the RLA that would be conducted by
22 Mr. Adida's firm verify the election -- Georgia's election
23 results in any meaningful way?

24 **A.** No, sir.

25 MR. MILLER: Your Honor, just in terms of where we

1 are characterizing testimony, I object to the compounding and,
2 frankly, leading questions. Again, I am not trying to make a
3 Zoom hearing more difficult than it already is. But I want to
4 raise that.

5 COURT REPORTER: Mr. Miller, I'm going to have to be
6 able to see you. I cannot hear and I cannot see him.

7 MR. MILLER: I'm sorry.

8 THE COURT: Ms. Cole said she was having trouble
9 hearing you too. You are a little bit remote. I'm able to.
10 But I'm not having to transcribe it.

11 MR. MILLER: Thank you. We'll work on our
12 microphones.

13 THE COURT: All right. Your objection is noted. I
14 think for efficiency purposes though since we are not on
15 rebuttal and like a whole set of witnesses after your -- after
16 Mr. Adida is now scheduled to testify in your case at 5:00 P.M.
17 tomorrow, there is no choice but to allow Mr. Stark to comment
18 on what he perceived as Mr. Adida's actual testimony based on
19 his affidavit.

20 I do want to say though that it is 2:20, basically
21 2:19. So we are kind of at 25 minutes into Mr. Stark's
22 testimony.

23 MR. BROWN: Your Honor --

24 THE COURT: Y'all projected about an hour including
25 cross-examination, I think.

1 MR. BROWN: Your Honor, unless you have some
2 questions for Dr. Stark, at this point, we will reserve any
3 further questions for redirect.

4 THE COURT: All right. Well, I think I will wait
5 until State's counsel has an opportunity to examine Mr. Stark.
6 Thank you.

7 MR. BROWN: Thank you, Doctor.

8 MR. MILLER: Thank you, Your Honor.

9 **(There was a brief pause in the proceedings.)**

10 COURT REPORTER: I am not going to be able to take
11 him down, Judge, if he doesn't get on the screen. I cannot
12 hear him.

13 THE COURT: All right. Ms. Welch, are you able to
14 see him? Have you looked at -- and you are looking at gallery
15 view?

16 COURT REPORTER: Yes. One of my boxes is being taken
17 up by Emily Levy. Otherwise, it is counsel of record.

18 THE COURT: Mr. Martin, are we able to move people in
19 terms of the sequence?

20 COURTROOM DEPUTY CLERK: No, ma'am. I'm not capable
21 of that. The only active videos are on the front screen.

22 COURT REPORTER: I can see Mr. Miller now. I can see
23 Mr. Miller now. He has popped up. But he is way away from the
24 mic. I can try.

25 MR. MILLER: Apologies for that, Your Honor, and

1 Ms. Welch.

2 THE COURT: No problem.

3 **(There was a brief pause in the proceedings.)**

4 CROSS-EXAMINATION

5 BY MR. MILLER:

6 **Q.** Good afternoon, Dr. Stark. How are you?

7 **A.** Good afternoon. Fine, aside from the fact that it looks
8 like Armageddon out the window.

9 **Q.** It is hard to separate the reality of the COVID outside
10 from the Zoom on the inside.

11 Dr. Stark, I am going to ask you just a few questions to
12 be able to go over your testimony here and your prior
13 declarations.

14 As you heard earlier with respect to your qualifications,
15 as to election security, you spoke to your experience with the
16 Election Assistance Commission; correct?

17 **A.** Yes, sir.

18 **Q.** And election security conference; correct?

19 **A.** Two conferences for roughly six years, yes, sir.

20 **Q.** And you spoke to advising Secretaries of State as well; is
21 that correct?

22 **A.** Yes, sir.

23 **Q.** Now, how much of that advising and participation was
24 rooted in risk-limiting audits as opposed to cybersecurity and
25 mechanics of actual machines?

1 **A.** Things are blended together to some extent because the way
2 to attain an evidence-based election, despite whatever cyber
3 vulnerabilities the system might have, necessarily involve
4 paper.

5 I'm a coauthor on a number of papers on end-to-end
6 cryptographically verifiable voting systems, including being on
7 the development team for the STAR-Vote system for Travis
8 County, Texas.

9 I have advised on issues related to paper flow issues
10 related to cross-checking electronic results against other
11 systems of record, including voter registration databases and
12 ballot tracking systems.

13 So it is a mix of a bunch of things. But issues around
14 cybersecurity, paper, and auditing are all commingled.

15 **Q.** And they all refer back to your expertise of risk-limiting
16 audits; correct?

17 **A.** That is not the foundation of it. It is through the
18 development of risk-limiting audits and the work that I have
19 done initially for the California Secretary of State, but I
20 became familiar with the underlying issues and gained exposure
21 to larger issues around the conduct of elections through
22 working closely with state and local election officials,
23 including lots of time on the ground looking at paper flow and
24 procedures and security procedures including physical security
25 procedures in election offices.

1 Q. And you believe that experience qualifies you to the
2 fields of human behavioral factors and human memory and
3 attention?

4 A. My experience around human and behavioral factors
5 experience and attention is partly through participating in the
6 design of the STAR-Vote system working closely with two human
7 factors experts.

8 Q. You yourself are not a human factors expert; correct?

9 A. I am not a human factors expert.

10 Q. You relied on the expertise of other people with the
11 expertise in that field; correct?

12 A. For what purpose? I'm sorry. I don't understand the
13 question.

14 Q. Well, to the extent that the human factors molded into the
15 concept of the STAR-Vote system, you were not the human factors
16 expert? You were relying on the opinions of others I believe
17 is what you just said; right?

18 A. I was not the human factors expert for the development of
19 the STAR-Vote system. That is correct.

20 Q. Okay. And so when you testify about voters review their
21 ballots, those are based on what, I think you will agree with
22 me, to be human factor-related observation; right?

23 A. I am relying -- for the numbers that I quoted, I'm relying
24 on two articles, one of which was by actually some human
25 factors experts I worked with on the STAR-Vote system, the team

1 from Rice, and the other by Alex Halderman, Matt Bernard, and
2 others from the University of Michigan.

3 **(Unintelligible cross-talk)**

4 MR. BROWN: I object. Please let him finish.

5 **A.** With regard to issues around human memory, attention, and
6 the ability to remember long lists of things, I'm relying in
7 part on my experience teaching undergraduate and graduate
8 students for more than three decades now and what I have seen
9 in testing and the work that I have done developing
10 graphical-user interfaces and online systems for online
11 education.

12 **Q. (BY MR. MILLER)** But you didn't conduct those studies
13 yourself; right?

14 **A.** I did not conduct those two studies. That is correct.

15 **Q.** And the team at Rice you are referring to, would that
16 include Dr. Byrne?

17 **A.** Yes, sir.

18 **Q.** Michael Byrne?

19 **A.** Yes.

20 **Q.** Okay. With respect to hand-marked paper ballots, have you
21 conducted any research as to the rate at which voters verify
22 hand-marked paper ballots?

23 **A.** I have not.

24 **Q.** Okay. And why is that?

25 **A.** Again, the human factors is not my particular area of

1 study. I'm not aware of any studies on the rate at which
2 voters do verify hand-marked paper ballots.

3 The issue here I believe is not the rate at which voters
4 either make mistakes or correct their own mistakes. The issue
5 is the distinction between a voter being responsible for his or
6 her own work and a voter being responsible for errors
7 introduced by the electronic technology.

8 MR. MILLER: If I can, I'll pull up what will be a
9 defense exhibit.

10 And, Your Honor, just because of the quick time line,
11 we have not shared this as well. But we can quickly email it.

12 THE COURT: If plaintiffs would also email your
13 documents -- your demonstrative to the defendants.

14 MR. BROWN: Yes, Your Honor.

15 THE COURT: Just remember I don't have it. We'll
16 deal with all what I don't have later.

17 **Q. (BY MR. MILLER)** Dr. Stark, can you see your screen now?

18 **A.** Yes, sir.

19 **Q.** Okay. Can you read that?

20 **A.** The New York Times, Florida Recount Senate Votes Yet Again
21 and Nelson's Chances Dwindle.

22 **Q.** Okay.

23 **A.** Shall I go ahead and read the article?

24 **Q.** No. I apologize. I, frankly, meant in terms of can you
25 read the text on the screen. But that is all fine as well.

1 **A.** It is not an eye test.

2 **Q.** Sure.

3 So, Dr. Stark, I believe you just mentioned a minute ago
4 that you hadn't found the voter's intent relevant to a
5 hand-marked paper ballot but instead were concerned that it
6 reflect the voter's vote or mark.

7 Is that approximately correct?

8 THE COURT: I'm sorry. I'm sorry. Mr. Miller, you
9 are getting more remote again.

10 MR. MILLER: I apologize. Can you hear me now, Your
11 Honor?

12 THE COURT: I'm having trouble seeing you. I guess
13 the --

14 MR. MILLER: Your Honor, I think right now --

15 THE COURT: Right now you are there.

16 MR. MILLER: Can you hear me now?

17 THE COURT: Yes. And I can see you now.

18 MR. MILLER: Okay. Thank you.

19 THE COURT: Though I see Ms. Welch, but I'm not
20 sure --

21 MR. MILLER: I'm sorry, Ms. Welch. I don't intend to
22 leave it up for too long. I apologize.

23 **Q. (BY MR. MILLER)** So, Dr. Stark, to go back to my prior
24 question there, I believe you were just testifying to the
25 extent that for a hand-marked paper ballot voter verifiability

1 is less of a concern because you are talking about whether the
2 voter properly marked it; is that right?

3 **A.** No, sir. That isn't an accurate reflection of my -- at
4 least what I intended to say.

5 **Q.** Please correct me.

6 **A.** Whether a voter verifies his or her hand-marked paper
7 ballot is up to the voter. And if a voter makes a mistake and
8 doesn't correct that mistake, that is on the voter on some
9 level.

10 In contrast, a voter can check a review screen on a
11 ballot-marking device or listen to the audio output of a
12 ballot-marking device. And yet what gets printed on the
13 printout isn't necessarily what the voter saw, what the voter
14 heard, or what the voter did. What is on a hand-marked paper
15 ballot is necessarily what the voter did.

16 **Q.** Okay. And I believe I understand your --

17 THE COURT: Could you just take down the Florida
18 recount because it is not helping our -- what we're trying to
19 see here.

20 MR. MILLER: Your Honor, if I could have the witness
21 read one sentence off of this.

22 THE COURT: You just read it. Read it aloud what you
23 -- there is no point in --

24 MR. MILLER: Okay.

25 THE COURT: Read what you want to ask him about.

1 MR. MILLER: Yes, Your Honor. I understand.

2 Q. (BY MR. MILLER) So, Dr. Stark, for that purpose, as to
3 the first contention, are you aware of the senate race in
4 Florida between Bill Nelson and Rick Scott?

5 A. Yes.

6 Q. And in that contest, do you understand the concern around
7 ballot design and a voter's vote on those ballots? Are you
8 aware of that?

9 A. I'm aware generally that ballot design, whether it is a
10 printed ballot or a ballot-marking device screen layout, can
11 greatly affect the rate at which voters make errors.

12 Q. And so specific to this instance here from this article --
13 and I'll read it to you -- Broward County was unusual in that
14 it had reported more than 30,400 of undercount ballots. They
15 were not miscounted -- excuse me -- if they were not
16 miscounted, then the most likely explanation was that they
17 were, in fact, left blank, possibly because of the way the
18 ballot was designed.

19 Do you understand that?

20 A. I heard what you said. Yes, sir.

21 Q. And do you believe this has any effect on your contention
22 that hand-marked paper ballots are essentially without fault in
23 the risk-limiting audit concept?

24 A. I'm sorry. I don't understand the question. Voters can
25 make mistakes whether they are using a hand-marked paper ballot

1 or a ballot-marking device. Poorly designed ballot layouts,
2 whether they are on screen or on paper, can increase the rate
3 at which voters make mistakes in marking their ballots.

4 But the difference is that if a voter left a contest blank
5 on a hand-marked paper ballot we know that the voter actually
6 left the contest blank on the hand-marked paper ballot, whether
7 it was deliberate or not. Whereas for a ballot-marking device
8 printout, if the contest is blank, we don't know whether that
9 is because of malware, voter error, or design or something
10 else.

11 **Q.** Well, I guess the question really boils down to your
12 concept of the voter's intent in leaving the ballot blank. So
13 it is your contention that a poorly designed ballot which
14 results in an undercount -- that a voter in that situation
15 should have no recourse? Should be upset only at themselves?

16 **A.** I'm sorry. If a ballot is poorly designed, that is a
17 problem. Ballot design should be reviewed before the election
18 to be checked for usability.

19 There are good guidelines on how to design hand-marked
20 paper ballots and on-screen ballots as well. I'm not sure what
21 you are getting at.

22 The risk-limiting audit can't get at what is in the
23 voter's mind. All it can look at is what the voter did if it
24 is a hand-marked paper ballot or what the machine did if it is
25 a ballot-marking device printout.

1 Q. That is precisely what I was getting at, Dr. Stark. Thank
2 you.

3 And, secondarily, in terms of audits generally, you stated
4 in your declaration that you had invented the risk-limiting
5 audit; correct?

6 A. Yes, sir.

7 Q. Am I correct in that being in the beginning of 2007?

8 A. Yes, sir.

9 Q. Okay. And following that invention, you agree that the
10 Election Assistance Commission extensively piloted this
11 concept; right?

12 A. The Election Assistance Commission provided support to the
13 States of California and Colorado for those states to conduct
14 pilots. Some pilots were conducted without funding from the
15 EAC. Some were conducted with money from the EAC.

16 Q. And in terms of piloting an audit, no audit just flips on
17 at the flick of a switch; correct?

18 A. I don't understand your question. But, first, the
19 number --

20 Q. Let me rephrase that. So in terms of the question is:
21 When you implement a risk-limiting audit, would it be your
22 opinion that you flip it on at the turn of a switch without
23 piloting and testing the proper processes and procedures?

24 A. Again, I don't understand the question. If the question
25 is whether the audits that were conducted that I'm calling

1 pilot audits genuinely fulfilled all the criteria of being
2 risk-limiting, I can speak to that. If there is an issue --

3 **(Unintelligible cross-talk)**

4 **Q. (BY MR. MILLER)** Dr. Stark, when you move forward to
5 implement a risk-limiting audit, say, in Colorado, for
6 example -- okay? -- would you suggest the State of Colorado
7 wholesale implement a risk-limiting audit without ever having
8 done it before and without piloting the concept?

9 **A.** There are a lot of moving pieces to conducting a statewide
10 risk-limiting audit. Conducting a jurisdictionwide
11 risk-limiting audit is a lot simpler. And many of the audits
12 that I'm calling pilot audits were genuine risk-limiting
13 audits.

14 Working out the regulatory framework and the legislative
15 framework for conducting binding risk-limiting audits clearly
16 takes some time. There are logistical aspects of how each
17 jurisdiction handles its paper, keep tracks of its paper,
18 organizes its paper, deals with chain of custody, and so forth
19 that need to be addressed. Those are not simple questions.

20 It is certainly a great way to get one's feet wet to
21 conduct pilots that are not binding, that are not under as much
22 pressure as a risk-limiting audit that has the legal
23 possibility of changing the outcome of an election would
24 require.

25 So I think pilots are terrific. I also think that with

1 good planning and help a jurisdiction could immediately move --
2 could move to conducting risk-limiting audits in one or more
3 contests either within jurisdictions or statewide on a couple
4 of months' notice.

5 **Q.** And did you think that the State of Colorado had that kind
6 of help when they were implementing the audit regime?

7 **A.** The State of Colorado had help from me, help from a number
8 of other election integrity advocates, help from, I think,
9 Colorado League of Women Voters.

10 Initially, there was no legal mandates to risk-limiting
11 audits. So things could only be done on a pilot basis. I'm
12 not sure how to answer your question.

13 **Q.** And, of course, the statewide risk-limiting audit as a
14 binding matter didn't come to fruition until 2017; is that
15 correct?

16 **A.** That's correct.

17 **Q.** And you are also aware that Colorado utilizes central
18 tabulation for their ballots; right?

19 **A.** Yes, sir.

20 **Q.** And so that all ballots are scanned through the central
21 count scanner, not through precinct scanners in various
22 counties?

23 **A.** There may be still some legacy systems that differ from
24 that. But I believe that their now uniform voting system
25 generally is central count optical scanner, that they are

1 largely a vote-by-mail state.

2 **Q.** Do you believe an RLA is effective on central scanning?

3 COURT REPORTER: I'm sorry. Can you repeat that?

4 **Q. (BY MR. MILLER)** Do you believe a risk-limiting audit is
5 effective in a central scanning jurisdiction?

6 **A.** Again, it depends on how it is conducted. I'm not sure
7 what you mean by effective. If the underlying paper trail is
8 trustworthy, if there has been a compliance audit to confirm
9 that the underlying paper trail was trustworthy, then a
10 risk-limiting audit, you know, will have a known minimum
11 probability of catching and correcting outcome-changing errors.

12 **Q.** And so I believe you mentioned earlier that you did not
13 believe that an audit -- a risk-limiting audit could ever be
14 effective on a ballot-marking device system; is that correct?

15 **A.** There is no audit procedure that can be conducted on the
16 output of ballot-marking devices to confirm that the outcome of
17 a contest is correct in the sense that it reflects what the
18 voters actually did on the BMD or saw on the screen or heard
19 through the audio.

20 The sense in which a risk-limiting audit may still be
21 worth doing is that it can catch -- it can detect whether
22 errors in the tabulation of a particular pile of ballots was
23 large enough to alter the reported outcome of one or more
24 contests.

25 But what it can't do is determine whether that particular

1 pile of paper is a trustworthy representation of what voters
2 did, saw, or heard.

3 **Q.** And do you believe a risk-limiting audit could be
4 conducted on, say, a DRE machine?

5 **A.** No -- well, again, a paperless DRE, absolutely not. A DRE
6 that prints a VVPAT, you could use the VVPAT as the basis for
7 an audit. It would have the same faults of using a BMD
8 printout as the basis for an audit would have. Namely, there
9 is little reason to believe that what is printed by the device
10 reflects what the voter did.

11 **Q.** And, of course, you engaged in an audit of that nature;
12 correct?

13 **A.** I have done a pilot audit that used the printout from --
14 the DRE printout in Orange County, yes, sir.

15 **Q.** And you did that in India as well; correct?

16 **A.** No, sir.

17 **Q.** Explain -- well, I apologize. In terms of the election
18 machine -- the electronic voting machine, are those similar to
19 a DRE that is used in India?

20 **A.** Yes. They have a -- they have a simple -- I actually
21 haven't seen one. I recall seeing photos of them. But they
22 have some kind of simple interface, and they print -- they
23 print a record. I think a single candidate or a single party.

24 **Q.** And so on that machine the vote is recorded inside the
25 machine; right?

1 **A.** Yes, sir.

2 **Q.** Okay. And the paper is not recorded --

3 **(Unintelligible colloquy)**

4 THE COURT: Whoever is speaking has to remember that
5 you are going to be sharing your voice and your remarks with
6 everybody else in the court. Thank you. Be careful.

7 Go ahead.

8 **Q.** **(BY MR. MILLER)** And so, Dr. Stark, in those instances,
9 the what you referred to as a VVPAT, which I take to mean a
10 voter verifiable paper audit trail, that was not a vote of
11 record; correct?

12 **A.** I'm sorry. That was not a --

13 **Q.** In the context of India, the printout that came on with
14 the EVMs was not a vote of record; correct?

15 **A.** I don't know Indian electoral law well enough to know
16 whether they considered the printout to be the vote of record
17 or the electronic record to be the vote of record.

18 **Q.** Let me put it this way: When tabulating, the machine is
19 tabulating the vote in the machine and it is not tabulating
20 anything on paper; correct?

21 **A.** That is correct.

22 **Q.** Okay. So you conducted an audit on these machines in
23 India; right?

24 **A.** No, sir, I did not.

25 **Q.** You wrote a paper on it?

1 **A.** I wrote a paper about a method for auditing electoral
2 systems like that used in India. I did not conduct any audit
3 in India. I have not been involved in the conduct of any audit
4 in India.

5 **Q.** And so do you believe this audit in India was a --

6 THE COURT: All right. I think -- I'm sorry. We are
7 really going far afield. If he was not, in fact, conducting
8 the audit in India, I mean --

9 MR. MILLER: Your Honor, we are trying to share a
10 screen here to see if this is referring to some published work
11 of Dr. Stark.

12 **A.** There has been no audit in India.

13 **Q.** **(BY MR. MILLER)** There has been no audit in India? Did I
14 hear that correctly?

15 **A.** Yes, sir.

16 **Q.** And you wrote this paper about concepts of auditing then;
17 is that right?

18 **A.** Yes, sir.

19 **Q.** Okay. So I believe you used the term security theater
20 before when you --

21 **(Unintelligible cross-talk)**

22 THE COURT: All right. I would like you to remove
23 the document. The thing about -- the reason why I'm trying to
24 get you to remove documents -- anyone, not you personally
25 necessarily -- is that unless the person -- we have to have our

1 attention drawn to it, then I can't -- then I can't see you and
2 I can't hear as well.

3 MR. MILLER: Yes, Your Honor. I understand. I
4 wanted to make sure that Dr. Stark and I were on the same page
5 as the study we're talking about.

6 **Q. (BY MR. MILLER)** But you are familiar with that study
7 we're referencing, Dr. Stark; correct?

8 **A.** I'm not sure I would call it a study. It is a research
9 paper. It introduces a mathematical method for auditing a
10 different electoral system from that that we use in the United
11 States.

12 I do believe that if an audit were based on, in essence,
13 the VVPAT output, it would have the same problems that it would
14 in the United States. Perhaps not quite as bad for a number of
15 reasons. The primary one being that what is reflected on the
16 paper printout is basically a single candidate or party, if I
17 understand correctly. It is not like checking a list of 29 or
18 30 different selections in different contests. It is a single
19 item being printed.

20 I think the cognitive load involvement verifying that is
21 much smaller. However, I don't know what procedures are in
22 India and how they vary from jurisdiction to jurisdiction
23 within India regarding what happens if a voter contests that
24 the printout doesn't match the button that the voter pushed on
25 the screen.

1 Q. And you're not aware of those procedures in Georgia
2 either, are you?

3 A. Excuse me?

4 Q. You are not aware of those procedures in Georgia either,
5 are you?

6 A. No, sir. I understand informally that if a voter requests
7 another opportunity to mark a ballot the voter is legally
8 entitled to. But I'm not even sure that that is correct in
9 Georgia.

10 Q. Okay. And you talked about hypothetical voters who might
11 have an issue and raise it and be ignored; is that right?

12 A. No, sir. I said that the poll worker or election official
13 would be in a bind if a voter raises an issue because the
14 options that are available to the election official or poll
15 worker are very limited, aside from allowing the voter an
16 opportunity to mark a new vote.

17 If you take a voter's claim that the machine misbehaved at
18 face value, you are faced with -- the only option is to do the
19 election over again. And if you don't give it any credence,
20 well, then an election could be -- the election result could be
21 incorrect because of malfunctions of the equipment.

22 Q. But you have --

23 (Unintelligible cross-talk)

24 A. There is no good option.

25 Q. -- to voter.

1 MR. BROWN: Objection, Your Honor. He was not
2 finished with his answer. Again, we have --

3 MR. MILLER: Your Honor, I'm not trying to cut off
4 the witness. But at some point this is a cross-examination
5 with yes-or-no questions and not (unintelligible). I realize
6 we are on Zoom, and I'm not trying to be difficult.

7 THE COURT: Let Professor Stark finish the answer if
8 he hasn't.

9 THE WITNESS: Thank you, Your Honor. I actually
10 don't remember what I was going to say.

11 THE COURT: All right. Go ahead, Mr. Miller.

12 **Q. (BY MR. MILLER)** On the exhibit you discussed in your
13 direct testimony, you referred to a hack rate; correct?

14 **A.** Yes, sir.

15 **Q.** And just to be clear, that document was not produced in
16 discovery; right?

17 **A.** That's correct.

18 **Q.** Was that document cited and included in your declaration?

19 **A.** No, sir.

20 **Q.** And so on those hack rates, you mentioned earlier you are
21 unaware of any study as to hand-marked paper ballot
22 verifiability.

23 How did you determine the hack rate relative to, say,
24 50 percent of hand-marked paper ballots in your hypothetical?

25 **A.** In the hypothetical involving 50 percent hand-marked paper

1 ballots, the only votes that were changed were votes that were
2 printed using ballot-marking devices. And I assume that there
3 was no change to votes made on hand-marked ballots.

4 **Q.** So you just assumed that there was no issue with a
5 hand-marked paper ballot; right?

6 **A.** No, sir. I assumed that electronic hacking can't change a
7 hand-marked paper ballot.

8 **Q.** And would you agree with me that a hack with a pencil or
9 pen could change a hand-marked paper ballot?

10 **A.** If there isn't a good chain of custody of ballots, if
11 insiders can alter marks on ballots, then there is a problem,
12 whether it is hand-marked paper ballot or ballot-marking device
13 output.

14 **Q.** And that chain of custody becomes even more difficult when
15 there is central tabulating scanners; correct?

16 THE COURT: When they are essential what?

17 MR. MILLER: I'm sorry. Central tabulating scanners.
18 Central count scanners, for example, in Colorado.

19 **A.** I don't see why that would be the case.

20 **Q.** (BY MR. MILLER) And when the voter is not him or herself
21 inserting the ballot into the scanner?

22 **A.** I don't think that that cuts one way rather than the
23 other. The chain of custody of the ballots matters regardless
24 of where the ballots are collected.

25 **Q.** And you have a couple of comments in the -- in your

1 declaration regarding the Fulton County pilot audit.

2 And just real briefly, you do understand that is a pilot;
3 correct?

4 **A.** It clearly was a pilot, but it was not represented as a
5 pilot by the Secretary of State's office.

6 **Q.** Would you agree with me that a press release is not the
7 equivalent of binding state policy?

8 **A.** Sir, obviously, it is not binding state policy. But it
9 was completely misleading. It said that it was a risk-limiting
10 audit. It said that it could catch and correct errors. It
11 said it validated the results. It said it followed best
12 practices established by experts in election integrity. And it
13 was none of those things.

14 **Q.** It was an example of trying to learn and work out the
15 kinks of implementing best practices? Would you agree with me
16 on that?

17 THE COURT: I really don't think this is helpful. I
18 mean, you are arguing with the witness about an article -- an
19 article about, I guess, the Secretary of State's office --

20 MR. MILLER: Your Honor, if I may, this is contained
21 in his declaration.

22 THE COURT: I understand that. But I don't think it
23 is going to materially make a difference to me. That is what
24 I'm trying to tell you.

25 MR. MILLER: Your Honor, one last subject matter here

1 and I'll be done.

2 **Q. (BY MR. MILLER)** And I would ask that we put the screen
3 share back on briefly.

4 Dr. Stark, can you see this on your screen?

5 **A.** Yes, sir.

6 **Q.** Okay. And do you see your name there at the top in the CC
7 line?

8 **A.** I do.

9 **Q.** Okay. I just want to ask you just a few general
10 questions.

11 Who is David Dill?

12 **A.** David Dill is a computer scientist formerly at Stanford
13 University. He has gone to Facebook from Stanford. He was the
14 founder of Verified Voting Foundation.

15 **Q.** And am I correct in assuming the other individuals on the
16 email are associated with Verified Voting?

17 **A.** That would not be correct. It is true of some of them but
18 not all of them.

19 **Q.** I understand. And so you yourself, Dr. Stark, are you
20 affiliated with Verified Voting?

21 **A.** No longer. I was on the advisory board for some years,
22 and I was on the board of directors for some years, and I
23 resigned last year.

24 **Q.** And how about Barbara Simmons? Do you know if she is
25 affiliated with Verified Voting?

1 **A.** Yes. Dr. Simons is the chair of the board of Verified
2 Voting.

3 **Q.** I apologize. Thank you for correcting me on her name.
4 Mr. Favorito, is he affiliated with Verified Voting?

5 **A.** Not to the best of my knowledge.

6 THE COURT: Tell me where you are going, Mr. Miller,
7 because right now you have gone longer than Mr. Brown. So just
8 tell me where you are going with this and how much longer are
9 you going to be.

10 MR. MILLER: Your Honor, the point as to this
11 exhibit, which is the only piece of evidence that was produced
12 in discovery, is that it demonstrates a disagreement, frankly,
13 within the organization as to what a risk-limiting audit is.
14 And it includes plaintiffs in this case.

15 THE COURT: Ask him a point-blank question rather
16 than -- why are we going through each of the individuals. If
17 you want to ask him, let him read the document and ask him a
18 question about it or else --

19 MR. MILLER: Yes, Your Honor. I guess the basis is
20 to form the foundation on the individuals listed here. I will
21 just ask him about two other individuals on this email chain if
22 that is okay.

23 THE COURT: Two. I mean, I just don't really see the
24 point. But that is -- I'm not going to restrict you. But I'm
25 telling you at this point, you know, you have one minute to

1 wrap up.

2 MR. MILLER: Yes, Your Honor.

3 Q. (BY MR. MILLER) Dr. Stark, Ms. Donna Curling is on this
4 email chain too; correct?

5 A. Yes, sir.

6 Q. And Ms. Marilyn Marks is on this email chain too; correct?

7 A. Yes -- yes, sir.

8 Q. Okay. And so if I could point you here to the email from
9 Ms. Simons to Ms. Marks. And we'll scroll down here to Curling
10 1000 -- excuse me -- 10019.

11 Do you recognize these emails from around Christmas of
12 last year?

13 A. Give me a moment to orient myself.

14 (There was a brief pause in the proceedings.)

15 A. Yes. I have read it now.

16 Q. (BY MR. MILLER) And do you recall this conversation?

17 A. Yes.

18 Q. And would you agree with my assessment that this is an
19 internal discussion and dispute as to whether RLAs are, in
20 fact, RLAs on a ballot-marking device?

21 A. Internal to what?

22 Q. To Verified Voting or I should say just interested
23 parties.

24 A. It is not internal to Verified Voting. There are a number
25 of parties who are not affiliated with Verified Voting,

1 including by that time me.

2 I mean, the president of Verified Voting, Marian
3 Schneider, had made some public comments which actually
4 triggered my resignation. And this enunciated position is
5 still not consistent with what I intend risk-limiting audit to
6 mean and what it is supposed to accomplish.

7 I think that this is part of the reason that Verified
8 Voting and I parted ways. Although they have come closer to my
9 position since I left.

10 **Q.** I'm sorry. And I take that to mean they still don't agree
11 with your position now?

12 **A.** There are still some published materials that contradict
13 my position. Although I understand from Dr. Simons that that
14 was not their intent.

15 **Q.** And would you agree that Verified Voting is generally a
16 specialized group focusing on as aspects like RLAs and voting
17 machines; right?

18 **A.** Verified Voting originally was primarily concerned with
19 internet voting and then electronic voting more generally.

20 In the last few years, they have been focusing primarily
21 on risk-limiting audits. Yes.

22 **Q.** And would you agree with me that reasonable people can
23 disagree and reasonable experts in the field can disagree as to
24 what constitutes effective RLAs?

25 **A.** No, sir. I think that anyone who disagrees with me on

1 this point is unreasonable.

2 **Q.** So any other individual that disagrees with you is
3 unreasonable? But you have the exact testimony; right?

4 **A.** Well, on this particular issue, I did come up with the
5 idea. The whole principle that it is supposed to fulfill, the
6 whole point of the audit is that it has a large chance of
7 correcting the reported outcome if the reported outcome is
8 wrong. And everything flows from that.

9 So some people are trying to redefine it so that it only
10 corrects some kinds of errors, so that it is fine to do it even
11 on an untrustworthy paper trail. I don't think that that is
12 the spirit of it. That is certainly not what I intended it to
13 be. That is not what the papers say.

14 **MR. MILLER:** Thank you, Your Honor. No further
15 questions.

16 **THE COURT:** Mr. Brown, do you have anything more?

17 **MR. BROWN:** I have one follow-up question.

18 **REDIRECT EXAMINATION**

19 **BY MR. BROWN:**

20 **Q.** Dr. Stark, putting aside your risk-limiting audit for the
21 moment, do you know of any audit no matter how well conducted
22 that could confirm this upcoming election in Georgia is
23 accurate if Georgia does not replace the BMDs?

24 **A.** No, sir. There is no pre-election, during the election,
25 or post-election process that can check whether BMDs altered

1 votes -- enough votes to change the outcome of the contest,
2 even if the resulting paper were tabulated perfectly.

3 MR. BROWN: Thank you, sir.

4 THE COURT: All right. Let me just ask you one
5 question, Dr. Stark.

6 EXAMINATION

7 BY THE COURT:

8 Q. When you were responding to the last questions that
9 Mr. Miller was making about whether you found it -- whether you
10 were right, whether they were right, I want to make sure I
11 understand this. I mean, you had -- when you developed the
12 concepts and principles of a risk-limiting audit, you indicated
13 that this was a -- basically a whole paradigm development and
14 construct of how it was done and you did this sort of as a
15 mathematician and as a scientist, if I understand your prior
16 affidavits and your resumes? Is that basically a fair summary,
17 or am I missing something?

18 A. I apologize, Your Honor. But I didn't quite understand
19 the question.

20 Q. All right. Well, my understanding -- I'm just looking --
21 was that you are an expert on statistics, on mathematics, and
22 you developed -- and that you developed the whole concept of
23 principles around risk-limiting audits.

24 And is that correct?

25 A. Yes, Your Honor.

1 Q. All right. And so when you were responding to Mr. Miller,
2 if I understand what your testimony was, is that from your
3 perspective as the kind of creator and author of risk-limiting
4 audits that you -- that paradigm that you don't find that these
5 are acceptable modifications? Is that a fair summary?

6 A. Yes, Your Honor. That the weakening of the concept
7 destroys the fundamental property that the audit has the -- has
8 a large chance of correcting the outcome if the outcome is
9 wrong.

10 I should say that I didn't develop this in a vacuum. This
11 started with work I did for the California Secretary of State
12 then Debra Bowen, who as part of her platform promised to
13 review the voting systems that had been deployed in California
14 and see whether they should be recertified or decertified.

15 She also pulled together a working group for post-election
16 audit standards. I was named to be on that working group. And
17 it was after reviewing what California and other states were
18 actually doing, reviewing the academic literature on auditing
19 that I was left dissatisfied with the state of the art and
20 spent some months trying to figure out what might work better.

21 And so it is from that practical application within the
22 context of an assignment from the California Secretary of State
23 that I developed risk-limiting audits.

24 Q. If I understand correctly, your focus is developing a
25 methodology that would allow you to catch systemic errors

1 that -- so that you could validate the election results
2 ultimately and correct processes that were lending themselves
3 to lack of integrity in the data?

4 **A.** Your Honor, I apologize for talking on top of you. The --
5 this flows from the fundamental question of what would we like
6 an audit to be able to do or what would we like auditing to
7 accomplish. And it seemed like at a bare minimum we would like
8 an audit -- we would like to know that when we are done with
9 the audit we have high confidence that the reported winners
10 really won. And so everything flows from that.

11 We are never going to get tallies exactly right. But in
12 contrast to financial matters, when it comes to elections,
13 there is a nice bright line for materiality. I decided to
14 treat an error as material if it changed the electoral outcome,
15 if it changed who won.

16 So instead of worrying about every last vote, this is kind
17 of a minimum standard to say we should at least ensure that
18 everything that happened was accurate enough to determine who
19 won. And so this is a procedure that relies on a trustworthy
20 paper trail -- and there are separate ways of establishing
21 whether the paper trail is trustworthy -- and uses that paper
22 trail to ensure that if the reported winner did not really win
23 there is a large chance of catching that incorrect ending.

24 THE COURT: All right. Thank you very much. We're
25 going to take -- it is 3:04. I have been keeping everyone's

1 time. And I took the last five minutes. The State, as I said,
2 took more than the plaintiffs. Just watch it because I'm -- I
3 am watching the time myself. We're going to take a five-minute
4 break and then resume.

5 Thank you very much. It is now 3:05. We will resume
6 at 3:10.

7 **(A brief break was taken at 3:05 P.M.)**

8 THE COURT: Plaintiffs' counsel, when we sometimes
9 have an echo, it is helpful to separately just turn off the
10 audio and to be speaking into the phone if I remember correctly
11 from that one evidentiary hearing we had with all the people at
12 different sites.

13 MS. ASCARRUNZ: Is this any better?

14 THE COURT: That's better. All right.

15 MS. ASCARRUNZ: I apologize.

16 THE COURT: All right. That is fine.

17 So you are calling Dr. Halderman next. All right.

18 COURTROOM DEPUTY CLERK: Dr. Halderman, if you would
19 please raise your right hand.

20 **(Witness sworn)**

21 COURTROOM DEPUTY CLERK: Thank you. Please state
22 your name and spell your last name for the record.

23 THE WITNESS: My name is Alex Halderman. That is
24 H-A-L-D-E-R-M-A-N.

25 Can you hear me all right?

1 THE COURT: Yes.

2 THE WITNESS: Thank you, Your Honor.

3 Whereupon,

4 J. ALEX HALDERMAN, PH.D.,

5 after having been first duly sworn, testified as follows:

6 DIRECT EXAMINATION

7 BY MS. ASCARRUNZ:

8 Q. Perfect. Good afternoon, Dr. Halderman. Given that the
9 Court is familiar with your credentials and has previously
10 accepted you as an expert in computer science specializing in
11 election security, I won't go through your entire credentials
12 and we can jump right into it unless the Court has any
13 questions.

14 THE COURT: Go ahead.

15 Q. (BY MS. ASCARRUNZ) Dr. Halderman, you testified last year
16 regarding the State's DRE and EMS system.

17 What did you do for purposes of the hearing today?

18 A. Well, we have been busy. I have been conducting forensic
19 reviews of the FBI's image of the Center for Election Systems
20 server at Kennesaw State. I have been examining DRE system
21 memory cards and internal memory images from a set of DREs that
22 have been provided to us.

23 I have -- as of last Friday, we got access to equipment
24 from the new system. And so I have been analyzing the BMD and
25 optical scanner system as well.

1 Q. And we can hear you, but it is a little bit soft. If you
2 can speak up or move closer to the mic, that would be helpful.

3 A. Is this any better?

4 THE COURT: Well, it is good. It is now loud for me.
5 But that is okay.

6 THE WITNESS: I'm sorry.

7 THE COURT: No. That is all right. Everyone else
8 needs to hear.

9 Q. (BY MS. ASCARRUNZ) Okay. So, Dr. Halderman, you said
10 that this weekend you started to do some work on analyzing as
11 well.

12 Could you explain what you did in that regard.

13 MR. TYSON: Your Honor, excuse me. Pardon me. I'll
14 just object here. The information for Dr. Halderman's analysis
15 of the Dominion system under this Court's order -- any
16 information he gained from it was protected by the protective
17 order in this case.

18 So I believe that we would need to close the
19 courtroom to hear the results of his analysis from that given
20 the issues raised in Dominion in this Court's order.

21 THE COURT: Well, this was precisely what I tried to
22 raise with you-all yesterday and everyone said we can handle
23 it. So I'm kind of -- no one said, oh, we're going to have to
24 have a separate proceeding.

25 MS. ASCARRUNZ: Your Honor, from our perspective, the

1 analysis that Dr. Halderman did was of material that is
2 publicly obviously visible and available to voters and others
3 during an election cycle. This particular set was given to
4 him -- access was given to him obviously in the context of this
5 case.

6 So we don't -- you know, the analysis that he did was
7 not particularly privy to any source code material or anything
8 along those lines or that nature.

9 THE COURT: All right. Well, I'm going to allow him
10 to begin. Mr. Tyson, you can renew your objection. I'll be
11 very sensitive to it. And I know that we did discuss this
12 issue so that if we -- if plaintiffs' counsel think we are
13 suddenly also -- that you are in a bad spot I would prefer to
14 have Mr. -- Dr. Halderman then speak at the end of the hearing
15 because then at least we can do anything else that is a public
16 matter then and then we could have a separate -- we can adjourn
17 and I can basically then hear his testimony towards the end.

18 MS. ASCARRUNZ: Thank you, Your Honor.

19 THE WITNESS: I will endeavor not to reveal technical
20 details that would (unintelligible) --

21 COURT REPORTER: There is some sort of -- I'm having
22 trouble understanding Dr. Halderman.

23 THE WITNESS: I hear a hum in the background.

24 THE COURT: I do too. What happens when you speak
25 again?

1 THE WITNESS: Let me try it. Can you hear me now?

2 THE COURT: Yes.

3 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, I think we were
4 discussing --

5 THE COURT: I really think that it is coming from
6 counsel's office because when you speak then we get that hum
7 again.

8 MS. ASCARRUNZ: I'll make sure to mute it when
9 Dr. Halderman is speaking. That may help.

10 THE COURT: All right.

11 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, with respect to the
12 analysis of the BMD materials and the equipment, what did you
13 analyze?

14 **A.** I analyzed the ballot-marking device itself and the
15 accompanying optical scanner that was provided from Fulton
16 County. Of course, this is just the beginning of the analysis.
17 We have only had the equipment since Friday afternoon.

18 **Q.** And were there any particular issues you are trying to
19 resolve or questions that you wanted answered?

20 **A.** Yes.

21 So the hum is back. I'm sorry.

22 THE COURT: Counsel, are you calling from your
23 Washington office or some -- a different office? Are you
24 with --

25 MS. ASCARRUNZ: Yes.

1 THE COURT: Surely there is somebody there who can
2 try to deal with the hums in there. It is like we have this
3 constant -- it is not more than a hum. It is higher.

4 Can you hear it yourself?

5 MS. ASCARRUNZ: We don't hear it here. We are
6 working on it to try to resolve it as we go through. It seemed
7 fine a little while ago.

8 THE WITNESS: Perhaps if counsel could mute the
9 microphone in Zoom while I'm giving my answer.

10 THE COURT: Can you do that?

11 MS. ASCARRUNZ: I have been doing that when
12 Dr. Halderman is speaking.

13 COURT REPORTER: Now she is muted.

14 THE COURT: I can't hear you now.

15 MS. ASCARRUNZ: I'm sorry about that. I was saying
16 we have been muting it over here on this end when Dr. Halderman
17 is speaking. But the hum is still going across on the end.

18 Can you hear me?

19 THE COURT: Yeah. Just proceed for now.

20 Are you able to hear the question, Dr. Halderman?

21 THE WITNESS: Could you repeat the question, please.

22 **Q. (BY MS. ASCARRUNZ)** I have lost track of it. But I think
23 the question was: What specific questions or issues were you
24 trying to resolve in your review of the system?

25 **A.** Well, so the initial review I have been doing has been a

1 form of penetration testing. I'm looking for attacks that
2 could be executed against the system, ways that attackers could
3 get information out of it, even simple things that an adversary
4 could do to try to forge votes.

5 **Q.** And what were you able to find?

6 **A.** Quite a lot actually, given the amount of time. We were
7 able to construct -- we were able to construct an end-to end
8 demonstration of one particular attack. And it was able to
9 find, quote, a number of different -- a number of different
10 avenues that an attacker could use to do even more damage.

11 Overall, the analysis so far has further confirmed my
12 existing impression based on studies performed in other states
13 that there is significant vulnerabilities in the Dominion
14 system.

15 **Q.** Let's get down to specifics. You mentioned an end-to-end
16 demonstration of an attack. What is that?

17 MR. TYSON: Your Honor, at this point, I'll renew my
18 objection in terms of whatever Dr. Halderman is about to speak
19 to. It is going to be from the information he learned in this
20 process of his review that the Court allowed.

21 His demonstration is to discuss something that has
22 not been tested by both experts, that has not -- is subject to
23 the protective order. So we will renew our objection to this
24 being done in open court.

25 THE COURT: What does plaintiffs' counsel have to

1 say?

2 MS. ASCARRUNZ: Your Honor, we believe, as I said
3 before, that this was information gleaned from equipment that
4 is visible to the public and available to the public.

5 Dr. Halderman did not review or look at any
6 proprietary information that was produced by the defendant.
7 That being the case, there is some material within his
8 testimony that we can cover that is not arguably within the
9 scope of any protective order. And I think Dr. Halderman
10 already committed to not revealing any technologically, you
11 know, sensitive information.

12 THE COURT: All right. What I think we should do is
13 -- unless Dr. Halderman is about to leave -- needs to leave for
14 some urgent appointment we should defer him -- his testimony to
15 a little later in the afternoon. And then he can -- you can
16 begin in the public while we have a public connection. And he
17 can testify about anything that is safely not confidential.
18 And then we can go off and resume ourselves privately.

19 MS. ASCARRUNZ: That is fine. Thank you, Your Honor.

20 THE COURT: All right.

21 MS. ASCARRUNZ: Dr. Halderman --

22 THE COURT: Go ahead.

23 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, we will set aside for
24 now the analysis that you did over the weekend and go through
25 some of the other issues that you had analyzed in this case.

1 Did you review --

2 THE COURT: Let me ask you this: What I was trying
3 to say is -- I mean, is he your last witness for the day?

4 MS. ASCARRUNZ: No, he is not, Your Honor.

5 THE COURT: So what I'm saying that would make better
6 sense, unless there is some foundation -- existential
7 foundation, why can't we just wait and let Dr. Halderman
8 talk -- begin his testimony later? And we'll have a continuity
9 rather than having him come and then somebody else and then him
10 coming back.

11 MR. CROSS: Sorry, Your Honor. This is David Cross.
12 The next witnesses, I think, are going to run into the same
13 issue, Mr. Hursti, maybe Ms. Dufort. So I don't know if --
14 from our perspective, this is the same as the hack that he did
15 to the DRE in the courtroom, which was public. It is the same
16 style of presentation.

17 He is not going to get into the specifics of how it
18 is done other than at a high level. So nothing technical.
19 There was no objection when we did that before, and that was
20 the system used.

21 So it is the same approach. But we are going to have
22 the same issue because the next two witnesses are going to talk
23 about the same equipment.

24 MR. TYSON: Your Honor, from the State defendants'
25 perspective, I mean, obviously the plaintiffs would not have

1 had access to this equipment without the Court's order allowing
2 it. It is not something that has been shared with us so that
3 we know what is going to be done here.

4 But to have someone who -- like Dr. Halderman who has
5 been found by the court in Pennsylvania in *Stein vs. Boockvar*
6 that he acted more as an advocate than an expert to demonstrate
7 something that may or may not be what it appears to be and for
8 which we have had no opportunity to test or see if it is what
9 it says it is, especially in the current environment regarding
10 the legitimacy of elections, this is definitely at least
11 information related to the security of voting systems covered
12 under the protective order.

13 I just -- I don't see that there is a reason why this
14 needs to be carried out in open court, given the issues and
15 given the stage of this case where we have had no opportunity
16 to test or even address whatever it is Dr. Halderman is about
17 to show. I don't know what that is because I haven't seen it
18 and it has not been shared with us.

19 THE COURT: I'm just trying to understand to move
20 forward because I'm -- A, I really think you should avoid the
21 attacks on any witness at this juncture. Secondly, I'm willing
22 to consider that if that is his testimony. But I was trying to
23 get to issues that were with him basically testifying in a way
24 that it would be more seamless. So really basically plaintiffs
25 just -- you picked up -- somehow you didn't hear what I was

1 saying.

2 But you are telling me that Dr. Hursti has the same
3 issue? That he was also looking at the documents at the -- all
4 right. Well, then what --

5 MR. CROSS: Well, Your Honor --

6 THE COURT: What we need to do then -- I'm sorry.

7 MR. CROSS: I understand. I'm sorry.

8 THE COURT: What we need to do is take a five -- a
9 ten-minute recess then again and let me talk to you-all on the
10 phone because I can't -- first of all, there is this hum
11 that -- Mr. Cross, that somebody has to deal with in the firm.
12 And because it is just -- it is going to drive us crazy.

13 And, secondly, I would like to understand what is
14 coming up next in the testimony and presentation. Of course,
15 there is a strong degree of interest in elections. I
16 understand the State's interest in basically not -- in having
17 the electorate feel confident about the electoral processes.

18 But there is also strong interest in openness about
19 this. So this is -- but I don't know what is coming up. So it
20 is really very difficult for me to manage from afar. So I
21 think just -- I'm very sorry to the public that we are jumping
22 up and down and we are having these problems. And it is
23 obviously to some extent a function of Zoom and some of the
24 sensitivity of the subject matter and my allowing this matter
25 to proceed at this -- at this time, which I think I also had an

1 obligation to do.

2 But, anyway, it is 3:30, and we'll -- we have the
3 telephone number we have been using to have phone conferences,
4 Counsel?

5 MR. TYSON: Yes, Your Honor.

6 MR. CROSS: Yes, Your Honor.

7 THE COURT: All right. Mr. Brown, do you have it
8 too?

9 MR. BROWN: I'll get it, Your Honor. Thank you.

10 THE COURT: All right.

11 All right. Mr. Martin, could you just establish that
12 line? And we'll all get on that -- anyone who is counsel.

13 COURTROOM DEPUTY CLERK: I'm going to put this on
14 hold, and I will open that right now.

15 THE COURT: Thank you very much. I appreciate it and
16 anyone who is -- anyone who is on this Zoom line, please mute
17 yourself and we will get back to you shortly.

18 **(Whereupon, the transcript continues with the**
19 **parties, counsel, and the Court speaking on a**
20 **telephone conference, as follows:)**

21 THE COURT: [REDACTED]
22 [REDACTED]
23 [REDACTED]
24 [REDACTED]
25 [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. CROSS:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. TYSON: [REDACTED]
[REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]
23 [REDACTED]
24 [REDACTED]
25 [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

MR. MILLER: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

MR. TYSON: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. TYSON:

THE COURT:

MR. TYSON:

LAW CLERK COLE:

MR. MILLER:

MR. CROSS:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

THE COURT:

MR. CROSS:

THE COURT:

MR. TYSON:

THE COURT:

MR. McGUIRE:

THE COURT:

MR. McGUIRE:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

MR. TYSON: [REDACTED]

MR. RUSSO: [REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. BROWN:

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. TYSON: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. McGUIRE: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. TYSON: [REDACTED]
MR. McGUIRE: [REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
THE COURT: [REDACTED]
MR. TYSON: [REDACTED]
THE COURT: [REDACTED]
MR. TYSON: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
[REDACTED]
[REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
COURTROOM DEPUTY CLERK: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
COURTROOM DEPUTY CLERK: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
[REDACTED]
COURTROOM DEPUTY CLERK: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
COURTROOM DEPUTY CLERK: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. TYSON: [REDACTED]

MR. CROSS: [REDACTED]

**(The telephone conference proceedings were
thereby concluded at 4:05 P.M. and all parties
returned back to the Zoom conference.)**

THE COURT: Are we ready to switch out witnesses?
And I will explain to those who are present what is going on.

MR. BROWN: Yes, Your Honor.

THE COURT: Is Mr. Hursti around?

MR. MCGUIRE: He looks like he is on Page 2 of 5 as
far as the pictures.

THE COURT: Oh, hi. And do any of the geniuses here
have a way of getting him to be on Page 1?

COURT REPORTER: Maybe if he speaks, Judge.

COURTROOM DEPUTY CLERK: If he turns on his video, he
will appear.

THE COURT: So is everyone ready to begin at this
point?

MR. BROWN: Yes, Your Honor.

MR. CROSS: Yes, Your Honor.

THE COURT: Okay. Ladies and gentlemen who are
listening in as members of the public, I determined that -- at
least initially that I should hear Dr. Halderman's testimony in
a sealed proceeding basically in a -- at the conclusion of the
testimony today. And then I will determine whether or not any

1 portions of it can be released on the transcript and any of the
2 exhibits.

3 I will explain that the Court authorized plaintiffs
4 with their expert to examine the sample BMD and associated
5 equipment. And they had purchased also a printer as the one
6 that was being used in any voting site. But part of the
7 ability to do that was an agreement to keep information
8 regarding the operation of the BMD confidential and the
9 internal operation.

10 And the question really is whether the testimony is
11 going to be interfaced in such a way that that would make it
12 difficult. The plaintiff attempted to purchase a BMD on the
13 market but would not be sold one. So that was how we ended
14 up -- or they ended up in this position and I had to address on
15 one hand their access to the information and on the other hand
16 the State's interest in protecting confidentiality of the
17 internal processes for other security reasons.

18 And there were other issues as well. So not knowing
19 how the testimony is going to end up exactly and knowing that I
20 have still the option of making it available otherwise and not
21 wanting to hold this hearing up further, we discussed the other
22 witnesses' testimony. I think it was advisable that we start
23 other witnesses scheduled for today.

24 So is Dr. Hursti the next witness?

25 MR. MCGUIRE: Yes, Your Honor. Mr. Hursti is ready

1 to be called.

2 THE COURT: All right. I see him now that he is
3 there. Thank you very much.

4 Mr. Hursti, thank you. You may go ahead. Just one
5 second.

6 Go ahead, Mr. Martin.

7 COURTROOM DEPUTY CLERK: Mr. Hursti, if you would
8 raise your right hand, please.

9 **(Witness sworn)**

10 COURTROOM DEPUTY CLERK: Thank you very much. If you
11 would please state your name and spell your last name for the
12 record.

13 THE WITNESS: Harri Hursti, H-U-R-S-T-I.

14 COURTROOM DEPUTY CLERK: Thank you.

15 Whereupon,

16 HARRI HURSTI,

17 after having been first duly sworn, testified as follows:

18 DIRECT EXAMINATION

19 BY MR. MCGUIRE:

20 **Q.** Mr. Hursti, just as the outset, have you had any access to
21 Fulton County election equipment that was produced on
22 September 4 pursuant to the Court's order and subject to the
23 confidentiality or the protective order?

24 **A.** I have not.

25 **Q.** Okay. Have you had access to any other discovery material

1 that has been produced in this case under a designation of
2 confidential or attorneys' eyes only?

3 **A.** I have not had access.

4 **Q.** Okay. Mr. Hursti, Mr. Halderman began to testify about
5 security of distributed components of the voting system. I
6 want to ask you about the security of the central components,
7 the system core, the EMS. I also want to ask you about how the
8 system records and tabulates votes.

9 I'm going to begin with your background. You have -- you
10 were -- the Court noted in August 2019 that you are a
11 nationally-recognized cyber expert. I would like to just talk
12 about your expertise in two different areas, voting system
13 security and ballot scanning.

14 First of all, on voting system security, can you tell us a
15 little bit about how you -- about your background in that area?

16 **A.** I was invited by election supervisor Ion Sancho back in
17 2005 to --

18 THE COURT: Speak a little more slowly -- all
19 right -- so that --

20 THE WITNESS: I'm sorry. English is my second
21 language.

22 THE COURT: No. That is quite all right. I have a
23 member of my family or did who had many different accents as
24 well. I understand. But I am trying to deal with a court
25 reporter who is trying to get everything down that you said.

1 **A.** So I was voluntarily invited by the election supervisor
2 Ion Sancho of Tallahassee, Florida, to examine the vote --

3 COURT REPORTER: Slow down, please.

4 THE COURT: You were invited by someone in
5 Tallahassee?

6 THE WITNESS: Yes. Tallahassee, Florida, by the
7 election supervisor Ion Sancho to examine --

8 THE COURT: We'll get the name later. The election
9 supervisor there in Tallahassee -- we'll get the name at the
10 conclusion. All right.

11 **A.** I will take the microphone here, so it is better
12 hopefully.

13 -- so to examine the system he was using. And
14 subsequently I have been part of a number of studies, most
15 notably a study commissioned by Secretary of State Ohio
16 Jennifer Brunner called EVEREST, which examined every single
17 voting system used in the State of Ohio.

18 That was one of the many studies. So I have been spending
19 15 years both in United States and overseas examining the
20 security properties of voting systems.

21 **Q.** **(BY MR. McGUIRE)** Thank you. Have you given testimony as
22 well before any presidential commissions?

23 **A.** Correct. I was invited by the Presidential Advisory
24 Commission on Election Integrity also called Pence-Kobach
25 Commission to testify about election security properties.

1 Q. And are you involved in any -- in any professional or
2 interest group conferences related to security?

3 A. Yes. I am a cofounder and co-organizer of the Voting
4 Machine Hacking Village at DEF CON. DEF CON is one of the
5 oldest and largest security community and hacker conferences in
6 the world, which attracted in 2019 when we were last time in
7 person 30,000 people to be present in Las Vegas.

8 Q. And in the course of your DEF CON conference, have you
9 ever looked at or examined BMD-type devices?

10 A. Yes, I have. We have been looking on eBay and government
11 surplus stores and bought everything what we find. So yes, we
12 have had BMD-type of devices, the first device being AutoMARK
13 Device.

14 COURT REPORTER: A what kind of device?

15 THE WITNESS: AutoMARK. It is a brand name.

16 THE COURT: AutoMARK, could you spell it for us.

17 THE WITNESS: A-U-T-O-M-A-R-K.

18 THE COURT: Thank you.

19 Q. (BY MR. McGUIRE) I would also like -- I also understand
20 you have an expertise in ballot scanning.

21 Can you talk about your background in that?

22 A. Back in 2005 when I started, one of the first things I
23 realized is that I need to build an open source software to
24 examine ballots. So I started both building a system how to
25 scan ballots and then process images. Eventually that system

1 has been used to process images, which I have not produced
2 myself.

3 So I have an expertise both how to examine images and also
4 how to examine images produced by others. Also I have a
5 background in computer graphics as well. So I have been
6 leveraging my knowledge about digital imaging technologies in
7 order to have a quick start in ballot images.

8 **Q.** And have you participated in any audits that deal with
9 ballot scanning software?

10 **A.** One of the public pilots we did was Arapahoe County which
11 is outside of Denver, Colorado, where we conducted multiple
12 different ways of risk-limiting audits. One of those involved
13 reimagining the images. That was a republican primary of summer
14 of 2014.

15 MR. McGUIRE: Your Honor, I would like to -- I can go
16 into more detail. But in the interest of time, I would like to
17 tender Mr. Hursti as an expert in two things, voting system
18 cybersecurity and ballot scanning, and then ask him some
19 questions about that in those areas.

20 MR. TYSON: Your Honor, we would have no objection to
21 the ballot scanning part of Mr. Hursti's expertise. I will
22 want to ask him some more questions about the cybersecurity
23 issues, specifically related to Dominion. We would object to
24 that, but I understand I can cover that in cross.

25 THE COURT: All right. That is fine. I think that

1 is certainly enough of a showing that he could proceed.

2 MR. McGUIRE: Thank you.

3 **Q. (BY MR. McGUIRE)** So, Mr. Hursti, you have given four
4 declarations in this case; correct?

5 **A.** Correct.

6 **Q.** Okay. I want to talk about the ones that you gave in late
7 August and September of this year. Specifically in your
8 declaration of August 24, which was Document 809-3 on the
9 docket, you talked about two investigations you had conducted.
10 One is June 9 where you were a poll watcher. The other is
11 August 11 when you did a Rule 34 inspection in Fulton County.
12 I want to cover those.

13 First of all, June 9. What did you do on June 9?

14 **A.** On June 9, we traveled across different precincts on
15 election day. The day before election day, I went to the
16 Atlanta Congress Center, whatever was that where the absentee
17 ballot, mail-in ballot process was, observing the equipment
18 from across from the room of what equipment they had, how they
19 processed, how the processes worked. And then after the
20 election day, observing the precincts, I went to English Street
21 to observe from the observation area how the election night
22 tallying and the information acquisition started.

23 **Q.** Okay. Thank you. And so in the course of your June 9
24 observations, you saw test ballots being printed; is that
25 right?

1 **A.** So in that area in one of the locations, the ballot
2 marking -- I arrived to the location because there was a report
3 that there was irregularities in the ballot-marking device
4 operations. I was told that the ballot-marking device produces
5 test ballots.

6 And while I was observing, I saw a voter who went to scan
7 their ballot. The poll worker -- after the machine rejected
8 multiple times, the poll -- he sent the -- told that this is a
9 test ballot. The voter went back with the test ballot and
10 picked up the real ballot and returned the test ballot into the
11 tray. So I observed that, and I didn't see the ballot, but I
12 believe that the poll worker when -- when the poll worker said
13 that this is a test ballot.

14 **Q.** So you detailed that in other observations in your
15 declaration; correct?

16 **A.** Correct.

17 **Q.** Okay. As far as your August 11 visit to Fulton County
18 election center, are your observations in your declaration --
19 does that substantially capture what you saw that day as well?

20 **A.** Correct.

21 **Q.** Okay. So, Mr. Hursti, I want to ask you: Based on your
22 expertise and based on what you observed, the things that you
23 have detailed in your declarations, do you have an opinion
24 about whether the Dominion voting system using BMDs is capable
25 of producing an accountable election result?

1 **A.** Taking into account that I, as I detailed in the
2 declarations, saw multiple different kinds of irregularities
3 and an unexplained behavior, there is a serious doubt that the
4 system was operating correctly. And in a theoretical level, as
5 detailed already by Professor Stark, when you don't have an
6 end-to-end chain of the voter's intent, when there is a system
7 which can either maliciously or by honest error reproduce wrong
8 kind of evidence, you don't have a capability of auditing.

9 **Q.** Okay. So without a capability of auditing, can you trust
10 the election results coming -- and without the chain of custody
11 and other issues you have described, you know, can you trust
12 the results coming out of the Dominion voting system?

13 **A.** I personally would say I cannot trust it. And also this
14 is not an election-specific issue. Any other industry, any
15 other system with similar faults in those same areas would be
16 equally untrustworthy.

17 **Q.** Okay. In your opinion, specifically looking at this as an
18 election system, as a voting system, is there a solution to the
19 problem of the system's untrustworthiness?

20 **A.** Yes, I believe there are. Based on the fact -- fact and
21 observations and what I have gathered, the solution would be
22 two-fold: First, moving to the hand-marked paper ballots. And
23 in the case of a precinct in-person voting, the deficiencies of
24 that scanner can be overcome by instructing voter carefully to
25 vote and providing a pen, which will be known to be recorded

1 well by the scanner, what would be a black felt pen so that it
2 gives no reflection. And at the same time, in home voting and
3 email voting -- home voting and mail-in voting, the solution
4 would be to use already existing scanners with more efficient
5 way producing a higher quality, more information, retaining
6 files to be used.

7 **Q.** Okay. So let me just break that down. Are you suggesting
8 the continued use of the BMDs?

9 **A.** I am not suggesting the continued use of BMDs. I am
10 strongly recommending to go to the hand-marked paper ballots
11 for the reasons being that when the system in between cannot be
12 trusted the chain of custody is broken.

13 **Q.** Okay. Let me ask you a question about scanners. Do you
14 have an opinion whether the Dominion system's precinct and high
15 volume scanners, the two different kinds of scanners, can be
16 relied upon to accurately count all the votes?

17 **A.** Not at this current type of settings and the way they
18 operate.

19 **Q.** Is that no, you don't have an opinion or no, they can't be
20 trusted?

21 **A.** No, they can't be trusted under the current configuration
22 and how they are currently being used.

23 **Q.** Okay. So is there a solution to that problem for the
24 precinct scanners?

25 **A.** Yes, there is a solution. As I stated before, my opinion,

1 the relief for the deficiencies of the system would be
2 carefully instructing voters how to fill the oval and enforce
3 use of a proper marking device, so using a black felt pen,
4 which that scanner seems to be very much liking and recognizing
5 more accurately than other kinds of pens.

6 **Q.** Okay. And as far as the high volume scanners that are
7 used to scan all the mail ballots, is there a solution to their
8 unreliability at counting votes?

9 **A.** Yes, I believe there is. That scanner is far more capable
10 than the precinct scanner. So that device can be configured to
11 capture higher quality and more information retaining images.
12 So instead of using a bilevel black or white capture images
13 which contain more information, for example, color or gray
14 scale images. And also that scanner is natively having higher
15 resolution than what is used to capture today.

16 **Q.** Okay. So I'm going to try and cover all that in the time
17 we have left. Let me just jump quickly to the security issue,
18 which dealt with whether the system can be trusted.

19 In your declaration, you talked about the system -- the
20 central system not being hardened. What do you mean by
21 hardening a system?

22 **A.** Hardening is the standard basic security practice under
23 the well-accepted principle that a general purpose device when
24 used with a lot of software for different purposes is more
25 vulnerable than a limited system which has all the minimum

1 necessary to accomplish the task. So it is just really using a
2 general purpose machine via single purpose machine. This is by
3 eliminating and removing all unnecessary software, removing all
4 unnecessary services, and removing all unnecessary drivers to
5 make it the bare bone minimum needed for the task. And that is
6 by reducing using the attack surface making it inherently more
7 secure.

8 **Q.** And based on what you have seen in your observations, has
9 the attack surface on the Fulton and other county servers been
10 reduced?

11 **A.** It has not been reduced. It is visibly obvious just
12 seeing in the start menus the icons of software which
13 absolutely doesn't have any role in election system. But also
14 in the examination of or inspection of the system in Cherokee
15 County and the information they produced show that to be the
16 case beyond any kind of question because they produced
17 information of all programs running, all services running, all
18 drivers running, and software installed. And that list is
19 comprehensively proving that the system has been not hardened.

20 Also the manager of election system there -- I'm sorry.
21 I'm dyslexic. He also outright stated to me that he -- his
22 understanding also is that system has not been hardened.

23 **Q.** Okay. I would like to show you what is marked as P --
24 Exhibit PX 4, if they can pull that up on the screen. If not,
25 I'll share my screen. Let me see if we have got anyone able to

1 do that. So can we widen that so the focus is on the screen?

2 So, Mr. Hursti, you said visibly -- you said the lack of
3 hardening was visible. Is this an example of that?

4 **A.** This is very much example of that. It is very much
5 visible that there are a number of computer game symbols on the
6 screen, and it is irrelevant whether those are installers or
7 can be highjacked the game itself. And any hardening would
8 remove all of this to be visible and remove all remains of that
9 from the system.

10 **Q.** So -- and I'm sorry. You said those were computer games?

11 **A.** That is correct. Some of those games are very much
12 recognizable, especially the bald gentleman on the bottom left
13 corner. That game is Homescapes from a Russian gaming company
14 where that Russian gaming company has been over times -- a
15 number of times under scrutiny about their business practices
16 and also the companion software and so-to-speak alleged spyware
17 that is spread with their games --

18 **Q.** And what election server is this we're looking at here?

19 **A.** This is a -- it is labeled underneath the monitor. This
20 is in Fulton County on the right-hand side of the central
21 tabulator rack. This is one of the client computers which this
22 part of the computer was used to upload the early voting vote
23 at the time when I arrived to the polling location on the
24 election night.

25 **Q.** Okay. I would like to pull up next Exhibit PX 5. And if

1 you can enlarge that as well, if possible.

2 Mr. Hursti, is this -- is this a similar example or
3 something different?

4 **A.** This is a similar example. This is from Cherokee County.
5 And this is a Windows integral interface, which they also
6 produced showing that Microsoft probably used Xbox gaming
7 console accompanying software is installed. Definitely not
8 something that you need in an election system. And if
9 especially this is a companion software, which is intended to
10 be communicating, this is opening attack surfaces -- vulnerable
11 attack surfaces.

12 **Q.** Do you mean attack surfaces?

13 **A.** Yeah. Attack surfaces.

14 THE COURT: Surfaces, Ms. Welch.

15 **Q. (BY MR. McGUIRE)** So in addition to what is installed on
16 the server, have you taken a look at any logs to try and find
17 out if these vulnerabilities have been exploited?

18 **A.** So we were provided by Fulton County a series of logs.
19 And one of the observations immediately was that from the
20 election night the security log is only 29 minutes long. It is
21 covering only a very short period of time, about 5:00 P.M.
22 to --

23 **Q.** Let me stop you there. Let me stop you there, and I'll
24 ask the technician to remove the exhibit. Can we replace that
25 exhibit with Exhibit 6 -- PX 6? I'm sorry. And can you widen

1 that, please?

2 So, Mr. Hursti, what are we looking at in PX 6?

3 **A.** We are looking at a Microsoft event viewer, which is
4 standard software to view all the logs of the system, viewing
5 application log, which was from Fulton County, provided when
6 Fulton County was asked to provide a log of the server. This
7 is the application log of that server in the viewer.

8 **Q.** Okay. And that blue line there, is that -- what is that
9 highlighting?

10 **A.** This is highlighting the fact that in this log, which is
11 application log, there is a significant gap of time from
12 6:59:34 A.M. to 3:52:31 P.M. where no log entries were present.
13 This is significant because if you see the previous days where
14 no election was conducted you had a previous day, which is
15 Monday 1561 log entries and on Sunday 1661 entries --

16 THE COURT: Slow down because if I'm having trouble
17 the court reporter is. So we have -- we are going to go over
18 this again. We have this day, which is I guess --

19 THE WITNESS: This is a log provided by Fulton
20 County.

21 THE COURT: Right. And what is the date? It is
22 6:59 A.M. in the morning? Is that what you are saying?

23 THE WITNESS: 6:59:34 in the morning on the 11th of
24 August --

25 THE COURT: All right.

1 THE WITNESS: -- which is the election day. So log
2 stops -- the application log stops at that point of time in the
3 morning of the election day, and it continues 3:52:31 P.M.
4 There are no log entries in between those.

5 THE COURT: All right. Go ahead.

6 **Q. (BY MR. McGUIRE)** Mr. Hursti, what would you have expected
7 to see on election day in a log of an election server in a
8 county that was conducting an election?

9 **A.** So, first of all, I compared this same period of time for
10 the day before and the day before that, so Sunday and Monday.
11 And I found that even when the election was not going on there
12 was 1561 log entries on the day before and 1661 log entries on
13 the same period of time on Sunday, which means that even if the
14 system is not used it will produce log entries.

15 Also, accompanied with this was a system log which shows
16 20 entries in this period of time spread over the whole period
17 of time showing that the system was up and running at the time.
18 So because of the election, I definitely would at least expect
19 to see the same amount of entries than what is the amount of
20 entries in the day when the election is not going, especially
21 because after the 3:00 P.M. when the log resumes on the gap
22 there is extremely -- there is a heightened amount of entries
23 from that period of time. So this gap -- it cannot be
24 explained.

25 **Q.** Okay. So, Mr. Hursti, we can go on and on like this. But

1 just in the interest of getting to the scanning portion, I just
2 want to ask you real quick just a single question.

3 In addition to hardening, is physical security something
4 that you have observed being a problem?

5 **A.** Physical security has been very much part of the problem.
6 In both locations, it is not because of any malicious. It is
7 just probably not training and instructing how physical
8 security should be conducted.

9 **Q.** So -- and that would include things like accessibility to
10 the equipment from unauthorized persons?

11 **A.** Correct. One of the very basic practices is that in order
12 for a system to be hardened physically all ports which are not
13 used in the computers are physically blocked or temporarily
14 blocked because the only thing -- this is an attack computer
15 made in U.S. costing \$99. You can take this and plug it in for
16 30 seconds to 60 seconds. That is all it takes to take over a
17 system. So --

18 **Q.** Let me stop you there. So you are holding up a USB stick;
19 is that right?

20 **A.** This looks like USB. It is a USB stick. But this is an
21 attack computer of its own freely available in the market, made
22 in America, designed in America.

23 **Q.** You just have to put that into an open port, and you can
24 take over a computer?

25 **A.** This can be programmed to carry out ultimate attacks.

1 There have been a number of times using this particular device
2 and assisted in the demonstration of how vulnerable systems are
3 if they are not physically protected.

4 The general purpose computer like what is used here is
5 consumer grade computer, cannot defend itself if physical
6 access is granted. And it is so quick -- the time period you
7 need to carry out, so on and so on.

8 **Q.** If there were an attack, would you expect to see evidence
9 in a log file?

10 **A.** If there would be attack, there should be some kind of
11 evidence there. Or the attack is sophisticated enough to
12 remove all evidence.

13 **Q.** So you would have missing log entries?

14 **A.** Missing log entries is a culprit of sophisticated attack.

15 **Q.** I would like to jump to scanning next. Now, there are two
16 types of scanners. There are central count scanners, and there
17 are precinct scanners, and I want to talk to you about both.

18 First, let's talk about the central count scanners. Tell
19 me -- tell me what your concerns are with the central count
20 scanners.

21 **A.** So the central count scanner -- the whole import of the
22 general purpose computers, general purpose scanner, cheap, low
23 quality, if you may, but no quality -- not that much quality is
24 needed in consumer product. So that is one part.

25 But second part is the way it is used because this is

1 really for the central count scanner it is like driving a
2 Porsche with the first gear blocked.

3 Sorry.

4 COURT REPORTER: Slow down, please. I am not
5 following you.

6 **A.** So the way the scanner is used in this environment is like
7 driving your sports car locked on the first gear. The scanner
8 itself is capable of producing a lot higher orders of magnitude
9 higher images than what it is currently doing.

10 **Q. (BY MR. McGUIRE)** So let me -- so let me see if I
11 understand.

12 What you are saying is that scanner is recording a lower
13 quality image than it is capable of?

14 **A.** That's correct.

15 **Q.** Okay. Why is it doing that?

16 **A.** The computers are doing exactly what they are asked to do.
17 So as part of the configuration, that scanner is instructed to
18 produce low quality images with a reduced amount of
19 information.

20 **Q.** Okay. I would like to show you Exhibit PX 7. I would
21 like to go to the second page and blow it up.

22 You know what? Hold on just a minute. So actually I'm
23 sorry. I mistook that. Let's look at the first page, but
24 let's blow it up. If we can scroll down to show the three
25 races that are on there.

1 So, Mr. Hursti, this is PX -- Exhibit PX 7. And are you
2 familiar with this -- what this is showing?

3 **A.** Yes, I am familiar with what this is showing.

4 **Q.** Can you tell the Court what we're looking at?

5 **A.** We are looking for a ballot image, which has reduced the
6 only white and black, no gray scales, and the ballot markings,
7 which the voter has conducted in the marking of this ballot.

8 **Q.** So these are real -- this is a real ballot that was
9 scanned in the central count scanner?

10 **A.** Correct.

11 **Q.** And these -- this is the image that the scanner recorded?

12 **A.** Correct.

13 **Q.** Okay. And you are saying that this is a lower quality
14 image than the scanner could have recorded?

15 **A.** Correct. Because this image is only 200 DPI, which is a
16 fraction of what the scanner is capable. Also, this scanner --
17 this image has been reduced to have only black or white pixels
18 based on algorithms and so-called business logic and the
19 scanner itself is capable of producing color images and gray
20 scale images.

21 **Q.** Okay. So now --

22 THE COURT: The scanner itself is capable of
23 producing what?

24 THE WITNESS: Color images and gray scale images.

25 THE COURT: Gray scale. All right. And you were --

1 the initials you used before, just so that the court reporter
2 gets it, was DBI or --

3 THE WITNESS: DPI, dots per inch.

4 THE COURT: Dots per inch. Okay. Thank you.

5 **Q. (BY MR. MCGUIRE)** Mr. Hursti, that first race that says
6 district attorney of the Atlanta Judicial Circuit, do you see
7 that?

8 **A.** I do see that.

9 **Q.** And do you see the mark next to Fani Willis?

10 **A.** Yes, I do see that.

11 **Q.** Would you expect a scanner to be able to count that mark?

12 **A.** Certainly I would.

13 **Q.** Okay. Let's go to Page 2.

14 So, Mr. Hursti, what does Page 2 show?

15 **A.** Page 2 shows the software interpretation of what it saw on
16 the ballot.

17 **Q.** And so this is the Dominion's central count scanner's
18 interpretation of how to count the ballot we just saw?

19 **A.** Correct.

20 **Q.** And under that first race for district attorney of the
21 Atlanta Judicial Circuit, it says Fani Willis. That is what
22 you would have expected; correct?

23 **A.** Correct.

24 **Q.** And so let's go back to the previous page one more time
25 and scroll down to the race for sheriff.

1 And you see that very similar mark there, do you not?

2 **A.** Yes, I do see it.

3 **Q.** And that is a vote for Theodore Jackson?

4 **A.** I would say it is a vote.

5 **Q.** Let's go to Page 2. Now, under -- on that record there
6 where it says sheriff, it says blank contest. What does that
7 mean?

8 **A.** It means that the voting system did not record any vote
9 being cast by the voter.

10 **Q.** Is this expected behavior for a central count tabulator?

11 **A.** This is not expected behavior.

12 **Q.** Okay. How can you explain what we are seeing here?

13 **A.** What we are seeing here is that the scanner is reducing
14 all information to either black or white and that
15 predetermination tells what the image is recording.

16 And after that, a mathematical algorithm is applied which
17 is only blindly counting how many black and white pixels it
18 sees and based on that make a determination if there is a vote
19 or not.

20 So based on that reduced information, the system didn't
21 cross the threshold to see that as a vote or even as ambiguous
22 mark.

23 THE COURT: By ambiguous mark, you mean it didn't
24 reflect either an ambiguous mark or --

25 THE WITNESS: Or as a vote cast.

1 Q. (BY MR. McGUIRE) Just to drive home that, what would have
2 happened if it had been marked as an ambiguous?

3 A. Well, that would have meaning that the system sees
4 something, which it says that it is not clear whether it is
5 mark or not. And that would have then gone to the human
6 process. But in this case, the system didn't even see that
7 there would be a mark of requiring a human observation.

8 Q. I would like to take down this exhibit and put up Exhibit
9 PX 7-1 -- 7.1. So let's go to Page 2 of this one.

10 So, Mr. Hursti, do you recognize this exhibit?

11 A. Yes, I do recognize this exhibit.

12 Q. So what are we looking at in this one that is different
13 from the other exhibit?

14 A. So these are not ballots which have been marked by a real
15 voter. These are test ballots, which we marked with various
16 type of colors of pens and various of ways to see what the
17 scanner is recognizing as a vote and what it is not recognizing
18 as a vote.

19 Q. And this was done not on a central count scanner but on a
20 precinct scanner; correct?

21 A. That is correct.

22 Q. Okay. Why do we see two different ballots?

23 A. Well, we see two different ballots because they are
24 produced by two different resolutions and qualities, which is
25 obvious from two different things. First of all, on the

1 right-hand side, you don't see any of the ovals even. So
2 even --

3 THE COURT: Ovals? You don't see any of the ovals
4 that you would circle in? Is that what you are saying?

5 THE WITNESS: Correct. The vote targets which are
6 signified as an oval -- this is on the left side -- have
7 disappeared on the right-hand side. The barcode on top
8 right-hand corner is a blur to the extent that most of these
9 barcodes can't be any more recognized and interpreted because
10 of the low quality.

11 And also more -- very importantly, if you observe the
12 text under the date, you see that the text is not evenly
13 recognized from left to right. Instead, it is disappearing on
14 the right-hand side. All of these are hallmarks of bad quality
15 scanning and bad quality technology.

16 **Q. (BY MR. McGUIRE)** Okay. And let's go to the next page.
17 And here you have a colored mark.

18 Is this showing the same thing?

19 **A.** Again --

20 THE COURT: When you say the next page, which page
21 are you talking about?

22 MR. McGUIRE: I believe we should be on Page 3, Your
23 Honor?

24 THE COURT: Okay. Thank you.

25 **A.** So this is underlining the fact why a scanning or either

1 in color or a gray scale is required because the business logic
2 of converting -- the scanner itself is seeing everything in
3 color. And then there is a business logic in removing the
4 color to make it black and white.

5 So when the red marking is not meeting that threshold
6 value and in this case of the IPC scanner, there are other
7 things which are typical in nature, meaning the color of the
8 light that is used to illuminate the ballot, it doesn't capture
9 those marks at all.

10 **Q. (BY MR. McGUIRE)** So if a voter -- the voter would vote on
11 the image on the far left, and the scanner ultimately winds up
12 tabulating the image that is on the right; is that correct?

13 **A.** Correct.

14 THE COURT: This is the top right here? Because I
15 have got two ballots.

16 MR. McGUIRE: And then the smaller --

17 THE COURT: I just want to make sure I'm looking at
18 the right thing. You are examining --

19 MR. McGUIRE: Yes, Your Honor. There is a ballot on
20 the left and a ballot in the middle. And then on the right,
21 the top right, there is an interpretation.

22 THE COURT: Okay.

23 THE WITNESS: So those are two images of the same
24 physical piece of paper. It is a common misconception that the
25 scanner is taking picture of the paper. Scanner is not a

1 camera. Scanner is analyzing the paper and producing an image
2 what the scanner software thinks the human wants to see.

3 It is very different than trying to be accurate
4 representation of the original piece of paper.

5 **Q. (BY MR. McGUIRE)** Okay. And so this is the precinct
6 scanner, not the central count scanner; correct?

7 **A.** On the right-hand side, that is the precinct scanner.

8 **Q.** Okay. So is there a solution to this problem with the
9 precinct scanners?

10 **A.** So for a precinct scanner, as it is very clear here, it is
11 not as sensitive as the left-hand side scanner. The solution
12 is to use -- instruct the voters carefully to fill the whole
13 oval and provide them a pen -- black pen which is not
14 reflecting because the precinct scanner is more sensitive to
15 that color and that combination than anything else. So it is
16 more likely that the voter intent is accurately recorded.

17 THE COURT: I just want to -- for the record want to
18 make sure that we're talking about the same document. This is
19 a -- this is a provisional ballot that -- absentee/provisional
20 ballot or emergency ballot that a voter filled out at the
21 precinct because I gather there was some reason they couldn't
22 vote on the machine at that point?

23 THE WITNESS: This is a test ballot, which we filled
24 in order to both find out what are the limitations of the
25 scanner and also in this case demonstrate what are the

1 deficiencies. Because we filled 28 ballots, which were
2 accepted by the scanner with a significantly high error margin
3 of votes not being recorded from the ballots by the precinct
4 scanner.

5 **Q. (BY MR. MCGUIRE)** So just to narrow that down, Mr. Hursti,
6 this is not a ballot that was used in an actual election;
7 correct?

8 **A.** Correct.

9 **Q.** This is a ballot that you filled out to test the
10 scanner -- the precinct scanner?

11 **A.** This is -- yeah. This is a ballot -- which this
12 particular ballot was not filled by me. But the sole purpose
13 of filling this out was to test what are the limitation of the
14 scanner. This is not a real vote from real election.

15 **Q.** Okay. And have you had an opportunity to look at actual
16 ballot images from a precinct scanner?

17 **A.** So we have been trying to get the actual images, but we
18 have been not getting the real images. And that is why the
19 only thing we can show in the precinct scanners are the test
20 images we made -- the test ballots which we created ourselves
21 that were run through the scanner.

22 **Q.** Finally, just to wrap this up, as between the precinct
23 scanner and the central count scanner, I understand that you
24 are proposing a different solution for the central count
25 scanners; is that right?

1 **A.** That is right.

2 **Q.** Okay. What is that solution?

3 **A.** The solution for a central count scanner is to allow that
4 scanner to capture the images with a higher resolution and
5 higher amount of information, meaning either color or gray
6 scale images. And since the standard of that kind of scanner
7 in office use is 300 DPI, which is obviously higher than 200
8 DPI here, just letting the current minimum standard of office
9 technology to be used.

10 **Q.** Okay. We can take the exhibit down.

11 So my last question for you, Mr. Hursti, is: Given what
12 you have seen of these scanners, in your opinion, are all votes
13 being counted by the current Dominion system?

14 **A.** We have been looking into different examples and
15 examinations. I don't believe all of the votes are being
16 counted.

17 MR. McGUIRE: Okay. Thank you. I have no further
18 questions except on maybe redirect, Your Honor.

19 THE COURT: Are you offering these exhibits into
20 evidence?

21 MR. McGUIRE: Yes. Yes. We would like to offer all
22 of these exhibits, 4, 5, 6, 7, and 7.1.

23 MR. TYSON: And we have no objection, Your Honor.

24 THE COURT: Okay. Later on, we should go back and
25 make sure if there are exhibits that were introduced in any of

1 the other witnesses that we address them. They are admitted.

2 MR. McGUIRE: Thank you.

3 MR. TYSON: Your Honor, are you ready for me to
4 proceed with cross?

5 THE COURT: Yes, I am.

6 CROSS-EXAMINATION

7 BY MR. TYSON:

8 **Q.** Mr. Hursti, good to see you again. I am Bryan Tyson. I
9 represent the State defendants. We met in Athens a few weeks
10 ago.

11 I just have some questions for you to walk through this.
12 But I want to start with: You personally believe that
13 hand-marked paper ballots is the best way to conduct an
14 election; correct?

15 **A.** Correct.

16 **Q.** And you personally believe that having paper pollbook
17 backups is the only or is the best way to conduct an election;
18 correct?

19 **A.** Correct. Because the current pollbook systems have been
20 demonstrably error-prone and they are not ready for prime time.

21 **Q.** You have stated that in your declarations, but that is not
22 based on any review you have undertaken of the Poll Pads? That
23 is based only on your observations from a public vantage point;
24 correct?

25 **A.** I am involved -- the Secretary of State of New Hampshire

1 examined these very same pollbooks. So yes, it is observation
2 but also in my other work for Secretary of State New Hampshire.

3 **Q.** Mr. Hursti, you don't have any specialized training or
4 experience in the administration of elections; correct?

5 **A.** Correct.

6 **Q.** And your training and experience, I believe, as we
7 discussed is focused on cybersecurity; right?

8 **A.** Cybersecurity and election security. Yes.

9 **Q.** And so when did you first personally examine a Dominion
10 BMD, or have you examined a Dominion BMD personally?

11 **A.** I acquired a -- the BMD ICP hybrid machine, which is a
12 ballot-marking device, different model from the Dominion than
13 that one, in 2017. And so I have been 2017 starting to examine
14 that ballot-marking device from Dominion.

15 **Q.** But you have not personally examined any of the Dominion
16 system that is currently used in Georgia except for the ICP; is
17 that correct?

18 **A.** I have not examined even the ICP used in Georgia. Not
19 ballot-marking device. Not the ICP.

20 **Q.** You mentioned earlier that you were involved in the
21 creation of the DEF CON Voting Village. Do you recall that?

22 **A.** I am a cofounder and co-organizer, correct.

23 **Q.** And are you aware of the criticism of the Voting Village
24 by the Department of Homeland Security because it gives access
25 that is not real world conditions for researchers?

1 **A.** I am not aware of the Department of Homeland Security --
2 the Department of Homeland Security giving that kind of
3 criticism. I am aware of general criticism from other sources
4 than the Department of Homeland Security.

5 **Q.** And you are being paid as an expert for the Coalition for
6 Good Governance; is that correct?

7 **A.** Correct.

8 **Q.** In your review and preparation of your declarations, did
9 you ever review Georgia State Election Board rules regarding
10 the storage of and access to components of the voting system?

11 **A.** I have cursory reviewed that. But I'm not certain how
12 accurate are the ones which are posted to the wall of the
13 Fulton County Election Preparation Center. So I have been only
14 examining the ones which are posted on the wall there.

15 **Q.** And so do you know for sure whether Georgia has specific
16 rules about the EMS and other components of the system being
17 connected to the internet?

18 **A.** I am not a law expert. I'm not a lawyer. I don't declare
19 to be that. So I'm not aware of the specific rules and
20 regulations in that area.

21 **Q.** And you concluded in, I believe, your December 2019
22 declaration that it was probable that a system like Georgia's
23 Dominion system would be targeted.

24 Do you recall that testimony?

25 **A.** Yes, I recall the testimony. And in the time of -- the

1 term where we are, all election systems are likely to be
2 targeted.

3 **Q.** And you are basing that probable statement not based on
4 actual knowledge of any hacking equipment that was actually
5 used in an election? You are basing it based on your
6 cybersecurity background; correct?

7 **A.** Cybersecurity background and also already published
8 studies, including the study which was published in DEF CON
9 Voting Village this summer which countries are targeting which
10 kind of systems and all. But it is not specific to any
11 specific location.

12 **Q.** But you are not aware of any hacking of voting equipment
13 that was actually used in an election -- correct? -- in
14 election conditions?

15 **A.** There are -- there is only anecdotal evidence of that.
16 And the reason is that all of the voting systems which have
17 been observed today in independent studies have one thing in
18 common. They don't record, preserve forensic evidence.

19 THE COURT: They don't preserve forensic evidence?
20 Is that what you said?

21 THE WITNESS: Yeah. Correct. The logs are not
22 protected, and they are very relaxed of capturing information
23 which would be required for forensic studies.

24 **Q. (BY MR. TYSON)** And it is your testimony that that is true
25 of all ballot-marking device systems?

1 **A.** I'm not making statement about ballot-marking devices.
2 I'm making statement about voting systems in general. And I'm
3 not making this statement specifically about Dominion. As I
4 say, all the systems have been independently studied. Dominion
5 system has not been independently studied because it has never
6 been submitted as a whole system to any independent studies.

7 THE COURT: I'm sorry. Just to make sure, it has
8 never submitted itself to an independent study?

9 THE WITNESS: No Secretary of State has so far
10 conducted the studies like the Secretary of State Ohio and
11 Secretary of State California where Dominion system would have
12 been part of the study.

13 **Q.** **(BY MR. TYSON)** And so, Mr. Hursti, just so I understand,
14 it is your testimony that the California system that reviewed
15 another version of the Dominion system -- your criticism is it
16 didn't review the version in use in Georgia; is that correct?

17 **A.** So my criticism here is that the last California conducted
18 independent study was conducted in 2007, which is called
19 California Top-to-Bottom Review. And no Dominion system was
20 part of that study.

21 **Q.** And Dr. Halderman in his declarations relies on SLI study
22 of Dominion BMD's system more recently in California.

23 Are you aware of that study?

24 **A.** I have browsed through a SLI study, which is posted in the
25 EAC website. I'm not aware of exactly the study, but I have

1 browsed through the study which is in the website. There is
2 actually multiple studies for different versions of the
3 Dominion Suite -- Democracy Suite software package.

4 **Q.** And are you aware of the study of the Democracy Suite 5.5
5 conducted in Pennsylvania by SLI and another study by Pro V&V
6 as well on security?

7 **A.** I have not read the study provided to Secretary of State
8 Pennsylvania. And also SLI is not independent study. It is a
9 volunteer guideline study based on -- paid by the vendor. So
10 that's not conducting an independent study as independent
11 studies are generally recognized in the security community.

12 **Q.** So it is your testimony that an EAC certified voting
13 system test lab, when it is conducting a security study, is not
14 an independent study of a voting system?

15 **A.** Independent study means that it is independent from the
16 voting system vendor. If the laboratory is paid by the vendor,
17 it is not independent study by the very definition.

18 **Q.** So just to clarify my question then, you would say if a
19 voting system vendor paid an EAC certified voting system test
20 laboratory for a security study you would not consider that an
21 independent study; correct?

22 **A.** Independent study is independent financially and by
23 control from the vendor. That is not independent study under
24 that definition.

25 I also would like to add that if you examine the Voluntary

1 Voting System Guidelines, it is very silent about security
2 properties. So, hence, that EAC study has very little -- very
3 little mandates with a real hardcore security study.

4 THE COURT: Hardcore what? I'm missing words. It
5 has little to do with a hardcore what type of study?

6 THE WITNESS: Security study. So the reason why
7 Secretaries of State like Jennifer Brunner of Ohio back then
8 and Debra Bowen of California back then -- why they wanted to
9 conduct independent studies is exactly to get rid of and to
10 have a study which is not by the current regulation paradigm.

11 **Q. (BY MR. TYSON)** Mr. Hursti, when you testified earlier
12 that you had examined the Fulton and Cherokee County EMS server
13 setups, are those the only two county EMS servers you
14 personally observed?

15 **A.** Yes. I have not touched them. I have been only observing
16 them. In the case of Cherokee, I was able to construct a
17 number of lines which the manager typed in. So I didn't touch
18 the machine.

19 **Q.** When Mr. McGuire was asking you about Plaintiffs'
20 Exhibit 4, you pointed out some various programs and icons that
21 were located on an EMS server.

22 Do you recall that testimony?

23 **A.** Correct.

24 **Q.** And do you know if the hardening process utilized by
25 Dominion removes the programs and the icons or just the

1 programs and leaves the icons in place?

2 **A.** So, first of all, if you are doing a hardening, you remove
3 both. And at the same time, based on the list of the output of
4 everything what we were able to get from Cherokee, that shows
5 that a lot of the programs are still there, a lot of the icons
6 are still there, and a lot of the services are still there,
7 things which would have been removed if the hardening had been
8 conducted.

9 **Q.** But you have not personally examined the EMS server to
10 conclude that all those are there? You are basing that on the
11 information you were able to gain from those reports and from
12 looking at those screens; correct?

13 **A.** Correct.

14 **Q.** You also testified that physical security was not
15 followed.

16 Was that in the Fulton County location or Cherokee or
17 somewhere else?

18 **A.** Both locations. Both in Fulton and in Cherokee.

19 **Q.** And I believe you testified already that you are not aware
20 of State Election Board regulations that mandate physical
21 security for certain components of the voting system; correct?

22 **A.** Correct.

23 **Q.** Was your visit to polling places on June 9 the first time
24 you had seen the Dominion system in use?

25 **A.** No. I have seen that multiple times in use in other

1 states.

2 **Q.** Was June 9th the first time you observed the voting
3 process in Georgia?

4 **A.** With this system, correct. I used to live in Georgia.

5 **Q.** I'm sorry. I'll let you finish.

6 **A.** No. I used to live in Georgia.

7 **Q.** Very well.

8 You would agree with me that physical security measures
9 can be used to mitigate cyber vulnerabilities; right?

10 **A.** Cyber defense requires physical because especially when a
11 general purpose consumer grade equipment are used that is a
12 fundamental requirement to achieve cybersecurity. It is not
13 mitigation. It is a fundamental requirement.

14 **Q.** And so when you testified in your declaration that not
15 having a password on the Poll Pad is an unacceptable practice,
16 you are basing that statement not based on Georgia's physical
17 security rules from the State Election Board? You are basing
18 that on your cybersecurity experience; correct?

19 **A.** That is correct. If you look in the Federal Information
20 Processing Standards, which are for everything -- which are
21 used in the private industry context, you see that passwords
22 are fundamental requirement.

23 **Q.** And in your declarations, you obviously identify a lot of
24 issues. But you would agree that they require more
25 investigation to determine what is actually going on; is that

1 fair to say?

2 **A.** Yes. Since the declarations I submitted, more information
3 has become available. So a lot of things which I have state to
4 be appearing, that is because of the amount of information I
5 had been able to obtain at that point in time. And later I
6 have learned more and got more evidence.

7 So that is why the -- certainly the level is limited
8 because I'm a very cautious man who wants to be certain that
9 what I have said is accurate.

10 **Q.** Very well.

11 One of the issues you identify in your declarations is
12 scanners taking differing amounts of time to accept or reject
13 the ballot.

14 Do you recall that testimony?

15 **A.** Yes, I do.

16 **Q.** And in reaching your conclusions or opining about that,
17 were you aware that there were five different ballot styles of
18 varying length in use in the June 9th primary in Georgia?

19 **A.** Yes, I was aware. And I was trying to observe to see if
20 the ballot style is giving a different time because you can
21 recognize the different ballots very easily from a distance.

22 **Q.** And you would agree with me though that different length
23 ballots could be a reason for a variation in a scanner's
24 processing time; correct?

25 **A.** When the ballot's QR code -- the amount of votes in that

1 shouldn't change the QR code interpretation time. So I cannot
2 conclusively say that it wouldn't. But it would defy the logic
3 of using QR codes.

4 **Q.** And, Mr. Hursti, did you examine any documents produced by
5 the State defendants in this case?

6 **A.** Only the documents which are not confidential or in any
7 way restricted.

8 **Q.** And are you -- you in your declarations have called for
9 additional testing for scanner thresholds.

10 Do you recall that testimony?

11 **A.** Yes, I recall. My statement here is that there are two
12 sets of parameters for scanner. The one parameter, which is in
13 the election software, and the other one is directly for the
14 scanner itself and the scanner driver. Those both need to be
15 in parallel locked into place to have any kind of meaningful
16 remedy into the problems observed right now.

17 **Q.** And are you aware that the State defendants produced a
18 document or did you review a document outlining the testing
19 process conducted by the Secretary's Center for Election
20 Services in studying ambiguously marked ballot samples?

21 **A.** I'm not certain I know which document you are referring
22 to.

23 **Q.** I'm going to share my screen here. I'm trying to make
24 this zoom in a little bit for you. It is kind of an executive
25 summary.

1 And down here at the bottom, you can see that it is
2 numbered State Defendants 0023540.

3 Do you recall ever seeing a document that looked like
4 this?

5 **A.** No, I actually don't. I have seen so many documents. But
6 I don't recall this document.

7 **Q.** Okay.

8 THE COURT: What number is it? Has it been submitted
9 to the Court?

10 MR. TYSON: I can submit it, Your Honor. I don't
11 believe it has been. I'll send it right now.

12 Just to Ms. Cole?

13 THE COURT: That is fine.

14 Are you offering it as an exhibit?

15 MR. TYSON: I am, Your Honor.

16 THE COURT: All right. Why don't you formally do so.
17 Then it is not just to Ms. Cole, but then you will deal with it
18 after you deal with the submission properly later.

19 MR. TYSON: Very well. So, Your Honor, we'll mark
20 this as Defendants' Exhibit -- and I believe we are on
21 Number 3. If not, Mr. Miller can correct me on that.

22 THE COURT: Just be careful when you email Ms. Cole
23 that you don't do it on the public -- I saw for a moment your
24 email to her and it was going to --

25 MR. TYSON: Oh, very well. Yes, ma'am.

1 **Q. (BY MR. TYSON)** Mr. Hursti, just to clarify then, you have
2 not looked at this document or were aware that the State had
3 conducted any kind of study like this?

4 **A.** I have -- I have seen the Dominion marketing material
5 discussing about the same topic. This is -- it has the same
6 discussion topic. But it doesn't look like this. So I can't
7 recall ever seeing this particular document.

8 **Q.** Very well.

9 THE COURT: What is the date of the document? Who is
10 it from? What is it that they are seeking to admit?

11 MR. TYSON: Certainly.

12 THE COURT: I need to know what it is.

13 MR. TYSON: Certainly. And I wanted to mark it just
14 so we had it for the record.

15 This is a report prepared by Michael Barnes at Center
16 for Election Services in July. It is part of the preparation
17 for the -- impartial preparation for the State Election Board
18 rule that was adopted today that relates to scanner thresholds.

19 MR. McGUIRE: Your Honor, I would just object to the
20 extent that Mr. Tyson is representing this as a report that was
21 prepared. But it is clearly marked draft. So it is unclear if
22 this is a final version of anything.

23 So I would object on the basis that it doesn't appear
24 to be what it is being represented to be on the face.

25 THE COURT: All right. Well, why don't you take a

1 look at it. And I'm not going to admit it at this point. But
2 he can -- you can ask him -- I mean, I don't think it is fair
3 to examine something -- him examine something that was a draft
4 because it probably wasn't distributed before as a public
5 document.

6 Was it distributed as a public document?

7 MR. TYSON: I don't know, Your Honor. I believe we
8 were going to have Mr. Harvey talk about kind of the process of
9 the rule that involves this analysis. Obviously, again, kind
10 of being out of sequence, I know it is a little bit difficult.
11 I just wanted to confirm Mr. Hursti has not seen this document.

12 THE COURT: He is indicating he has seen some
13 materials. I don't know whether it is from Dominion. I don't
14 know whether this is a Dominion -- all Mr. Barnes or whether
15 Mr. Barnes absorbed some of the information that was provided
16 by Dominion or what.

17 But -- so I think that in terms of -- you ought to --
18 if you want to question about anything, at least give him an
19 opportunity to look at it and read it.

20 MR. TYSON: Yes, Your Honor.

21 THE COURT: I don't know that he would have seen a
22 draft.

23 When did you provide it to the plaintiffs?

24 MR. TYSON: This was part of the group of documents
25 provided with the expedited discovery, Your Honor, related to

1 the --

2 THE COURT: So sometime in the last ten days or so?

3 MR. TYSON: Yes, Your Honor, I believe so. The 31st
4 or somewhere around there.

5 THE COURT: Okay. Well, I think his affidavit is
6 around there. The one before then and maybe there was one
7 September 1st. So I don't know.

8 Go ahead.

9 MR. McGUIRE: Your Honor, I have no objection to him
10 examining Mr. Hursti about anything that is in the document as
11 long he is not examining him based on him having familiarity
12 with the actual document, which he hasn't seen and obviously on
13 Zoom can't see.

14 MR. TYSON: Your Honor, again, I wasn't intending to
15 go line-by-line in this document. My intent was just
16 Mr. Hursti called for more research.

17 Was he aware that there was at least some research
18 that had been performed? That is the limitation. That is as
19 far as I was going to go.

20 THE COURT: All right.

21 MR. TYSON: So if we could -- Mr. McGuire, if we
22 could have Plaintiffs' Exhibit 7 put back up on the screen.

23 MR. McGUIRE: Sure.

24 MR. TYSON: I'll ask Mr. Hursti a setup question
25 here.

1 **Q.** (BY MR. TYSON) Mr. Hursti, you testified towards the end
2 of your testimony that voters should be instructed to fill in
3 the oval on a paper ballot.

4 Do you recall that testimony?

5 **A.** Correct.

6 **Q.** And have you reviewed the instructions that are on the
7 absentee provisional emergency ballot -- paper ballots that --

8 **A.** I have.

9 **Q.** And so you are aware looking at Plaintiffs' Exhibit 7 on
10 Page 1 that those instructions tell voters to fill in the
11 bubble; correct?

12 **A.** Correct. And many of the voters haven't been following
13 that which means that the instructions have not been effective.

14 **Q.** And you also see there on Page 1 of Plaintiffs' Exhibit 7
15 that only blue or black pen or pencils are to be used? Do you
16 see that?

17 **A.** Correct. And in the testing, it was found that inks which
18 are visible to human eye blue if they contact red pigment which
19 human eye cannot see the scanner is not very effective to
20 detect those markings. So the blue markings themselves are not
21 effective with the scanner.

22 **Q.** Very well.

23 Are you aware that the SEB -- the State Election Board
24 adopted rules relating to scanner thresholds at their meeting
25 today?

1 **A.** I was listening over one state of board elections thing.
2 I was on the audio only. I didn't see any documents. I heard
3 the conversation then and the ruling. But I did not know it
4 became effective today.

5 **Q.** And if we could go to the second page of Plaintiffs'
6 Exhibit 7.

7 Mr. Hursti, you earlier testified that the AuditMark would
8 contain ambiguous vote information and that it was marked
9 information.

10 Do you recall that?

11 **A.** Yes.

12 **Q.** Are you -- are you certain of that, or is it possible that
13 the ambiguous voter information is located somewhere other than
14 the AuditMark on the Dominion system?

15 **A.** So the ambiguous mark reading comes to the screen of the
16 voting machine. And with the logic unclear to me, sometimes it
17 overrides, sometimes not. I haven't been able to witness
18 enough other people doing -- operating the machine to
19 understand what the logic is.

20 **Q.** So you are not certain that the AuditMark would contain
21 ambiguous marked information? You are just assuming that?

22 **A.** I have seen an AuditMark -- AuditMark logs which have
23 entries indicating there has been ambiguous marks. Those have
24 been provided by the counties which are providing information.

25 So I am not -- I have not witnessed a number, under which

1 conditions the AuditMark is having that information log, but it
2 can be logged.

3 MR. TYSON: And we can stop the screen share now.
4 Thank you, Mr. McGuire.

5 MR. MCGUIRE: Thank you.

6 **Q. (BY MR. TYSON)** Mr. Hursti, you would agree with me that
7 hand-marked paper ballots also have vulnerabilities to
8 manipulation by bad actors; correct?

9 COURT REPORTER: Manipulation by what?

10 MR. TYSON: I'm sorry. I'll just ask it again.

11 **Q. (BY MR. TYSON)** You would agree with me that the
12 hand-marked paper ballots also have vulnerabilities to
13 manipulation by bad actors; correct?

14 **A.** There is no such thing as perfect system.

15 **Q.** So is that yes?

16 **A.** Yes. Everything can be -- everything can be -- with
17 enough resources and motivation can be turned. So hand-marked
18 paper ballots is the best we have. Nothing is ever
19 100 percent.

20 **Q.** And it is your testimony that Georgia should not use its
21 Dominion optical scanners in the November 2020 election without
22 adjusting or making changes to the software that is utilized;
23 is that correct?

24 **A.** Yes. As a stop-gap measurement and mitigation, the way it
25 is operating and the way the configuration is set up should be

1 examined and changed to ensure that every vote counts.

2 **Q.** And, Mr. Hursti, my last question: Is it your testimony
3 that Georgia voters can have no confidence in the voting system
4 that we use in our elections?

5 **A.** In the situation where logs cannot be produced, when basic
6 security principles cannot be verified, I think it is very
7 prudent to say you couldn't trust something you cannot verify.
8 Even Ronald Reagan mentioned that, trust but verify. There is
9 no way to verify right now.

10 MR. TYSON: Okay. Thank you, Mr. Hursti. I don't
11 have any further questions.

12 MR. MCGUIRE: Your Honor, I just have a couple of
13 clarifying things on redirect very short, if I may.

14 THE COURT: Yes.

15 REDIRECT EXAMINATION

16 BY MR. MCGUIRE:

17 **Q.** Mr. Hursti, Mr. Tyson asked you if the precinct scanner
18 that you looked at was the one used in Georgia, and you said it
19 was not the one used in Georgia.

20 Can you explain why that is -- what the difference is
21 between the precinct scanner you examined and the precinct
22 scanners that are used in Georgia?

23 **A.** I don't believe there is any difference. It is a
24 physically different device because the device I bought was
25 used in New York. I don't believe there is meaningful

1 difference.

2 **Q.** So as far as actually reviewing a scanner that is used --
3 that has been used in Georgia, have you had any opportunity to
4 do that?

5 **A.** I have not been able to do anything else and observe when
6 other people are using the scanner.

7 **Q.** Okay. Second, Mr. Tyson asked you about the State
8 Election Board's rules governing storage and access to a voting
9 system and if you were aware of those rules.

10 Let's assume that those rules exist, and let's assume that
11 what you have observed is consistent with those rules.

12 Are the rules adequate to protect Georgia's elections?

13 **A.** I would say that if those are the rules then the rules are
14 not adequate and looking to other states, which kind of rules
15 they have enacted, and maybe get some best practices from other
16 states.

17 **Q.** Finally, you talked about the certification laboratories
18 that test voting systems for EAC certification. My
19 understanding is you don't believe those are independent
20 because they are paid by the vendor; correct?

21 **A.** In every industry, it is the same. Independent means that
22 you are independent from the vendor you are inspecting. And
23 receiving payments itself is a threat to that independence.

24 **Q.** And so do those labs test for -- is there distinctions
25 between testing for security and testing for functionality?

1 **A.** There is a humongous distinction between that. Security
2 is very much inconvenience in a lot of things because people
3 want to do things the easy way. Functionality is something
4 else again. So there is a humongous difference between testing
5 usability, testing physical shocking and writing, functionality
6 and security. They are all distinguishable different
7 disciplines.

8 **Q.** Based on what you know of how the certification labs test
9 voting systems for certification by the EAC, do they test both
10 functionality and security to the appropriate standard?

11 **A.** We have been conducting -- I have personally been involved
12 in EVEREST study. All those systems have passed the EAC
13 certification testing. And yet we found and reported 380 pages
14 of vulnerabilities even in the redacted version.

15 MR. McGUIRE: Thank you. I have no further --

16 THE COURT: Redacted version? Is that what you said?
17 Even in the redacted version?

18 THE WITNESS: Yes. Redacted version was 380, top of
19 my head, plus or minus one page, if my memory is incorrect.

20 THE COURT: And this -- your report was independently
21 published, or was it submitted to EAC or some other entity?

22 THE WITNESS: So that study was commissioned by
23 Secretary of State Ohio. The study was conducted by Penn State
24 University -- team under Penn State University. So it was
25 independent. There was a university in between. And there was

1 the Secretary of State office in between. There was no direct
2 connection of money or otherwise with the vendor.

3 And this is really how independent studies should be
4 conducted. The team was conducting the study are not bound and
5 cannot be in any shape or form influenced by the people they
6 are examining and the system they are examining.

7 MR. TYSON: Just one brief follow-up question.

8 RECROSS-EXAMINATION

9 BY MR. TYSON:

10 **Q.** Mr. Hursti referenced a report from the Secretary of State
11 of Ohio. It is your testimony that all of the machines that
12 were examined in that report were EAC certified?

13 **A.** I believe that the system -- because they were in use.
14 Top of my head -- the report speaks for itself. Everything
15 what is there is listed.

16 But since Ohio requires certification, I believe they
17 were. But don't get -- look at the report. If there is
18 something, the report is correct and I'm wrong.

19 **Q.** And, Mr. Hursti, on that point, was any Dominion system
20 used -- the Dominion system used in Georgia part of that study
21 in Ohio?

22 **A.** Dominion has later acquired system different vendor. So
23 they were -- they are systems which are now under Dominion.
24 But none of the systems which is currently used here, the
25 precinct scanner, was not part of that study.

1 MR. TYSON: Thank you. I don't have any further
2 questions.

3 THE COURT: So let me ask this question, Mr. Hursti.

4 EXAMINATION

5 BY THE COURT:

6 Q. You recommended that the -- that the -- the scanners be
7 adjusted, they be higher basically -- higher digital quality --

8 A. Correct.

9 Q. -- or resolution. Can you articulate why anyone -- why
10 the State wouldn't do this? I'm trying to understand that as
11 well as what your response would be.

12 A. So I can only speculate why a choice has been made in
13 Dominion to artificially create images, which haven't been
14 accepted even for tax purposes for decades. Maybe it is to
15 have the same quality of images coming from the precinct
16 scanner or high speed scanner.

17 But I don't see any reason why -- why would you -- why
18 wouldn't you use the equipment you already have in hand the
19 best possible way as long as it doesn't lower any performance,
20 et cetera and since 300 DPI, which is obviously a little higher
21 than 200 DPI, and a higher information density is the office
22 standard -- office industry standard. I don't understand why
23 wouldn't you use what is standard for any general purpose
24 office.

25 Q. And is it your testimony that using the 300 DPI would

1 capture some of these marks that are now not evident?

2 **A.** The 300 DPI accompanied with changing it from solely black
3 or white to be either gray scale or color is critical to
4 capture that additional information. Because right now the
5 settings of the scanners are reducing the amount of
6 information. They are removing marks which the scanner saw,
7 and the marks are never translated to the files which are going
8 to the election system based on threshold values which happen
9 before the election software even sees that image.

10 So it is not only the resolution. It is the amount of
11 information which at the minimum have to be gray scale,
12 preferably color. That captures then what is the true look of
13 the ballot, how the voter saw it and marked.

14 **Q.** So just taking that last step there, you were saying it is
15 not just simply that it removes it but it basically -- when it
16 feeds it into the vote, it is not being counted, I assume, is
17 what you are saying?

18 **A.** So if, for example, the voter is using a pen, which is not
19 completely black, the scanner can remove that mark from the
20 image if it doesn't meet the scanner's internal threshold in
21 the translation of the sensor to the black and white. And that
22 is why it is paramount importance to capture more information
23 to the image itself so that the voting software has more to
24 analyze and can be more accurate.

25 THE COURT: Are there any questions in light of mine?

1 MR. MCGUIRE: Just to clarify -- yes, Your Honor, if
2 I may.

3 REDIRECT EXAMINATION (Further)

4 BY MR. MCGUIRE:

5 Q. Mr. Hursti, how difficult is that step of reconfiguring
6 the scanner to read that additional information, whether it is
7 the precinct scanner or the central count scanner?

8 A. The precinct scanner might be impossible because of the
9 hardware limitation of that. In the high speed scanner,
10 because that is a standard commercial off-the-shelf Canon
11 scanner, it is natively lots better images. That shouldn't be
12 troublesome at all.

13 Q. So that is a setting that is accessible to whoever has
14 access to the scanner?

15 A. Correct.

16 MR. TYSON: Your Honor --

17 THE COURT: Are either or all -- I just want to make
18 sure that -- I'm sorry.

19 These then would be the absentee ballots that are
20 coming into the central office essentially that are being -- if
21 they were not able to scan provisional ballots or they would
22 send -- the precincts would send them as well as far as you
23 know?

24 THE WITNESS: Yeah. And the real problem is the
25 people who are voting at home, they use whatever pen they have

1 and might be rushed to go to school or whatever. It is very
2 hard to enforce them to use proper pen. In-person voting even
3 when the scanner -- the precinct scanner is inferior, it is
4 easier to enforce good behavior from the voter than in-home
5 voting where people are going to do whatever they do anyway.

6 THE COURT: It sounds like a discussion about
7 instruction.

8 MR. McGUIRE: And I think the answer to your
9 question, Your Honor, was that the central scanner does scan
10 the mail ballots, the absentee ballots.

11 THE COURT: All right.

12 MR. TYSON: Your Honor, I just had one additional
13 question.

14 RECROSS-EXAMINATION (Further)

15 BY MR. TYSON:

16 **Q.** Mr. Hursti, is it your testimony that a change in the
17 scanner threshold settings does not require new EAC
18 certification of software, or do you know?

19 **A.** I don't know.

20 MR. TYSON: Thank you.

21 THE COURT: All right. Thank you very much. I
22 appreciate it.

23 THE WITNESS: Thank you, Your Honor.

24 THE COURT: How long is Ms. Dufort's testimony?

25 MR. BROWN: Your Honor, her testimony will be around

1 ten minutes.

2 THE COURT: All right. Well, it seems like a good
3 thing to do right now.

4 MR. BROWN: Plaintiffs would call Jeanne Dufort.

5 COURTROOM DEPUTY CLERK: Ms. Dufort, if you would
6 please raise your right hand.

7 **(Witness sworn)**

8 COURTROOM DEPUTY CLERK: Thank you, ma'am. If you
9 would, please state your name and spell your last name for the
10 record.

11 THE WITNESS: My name is Jeanne Dufort, D-U-F-O-R-T.
12 Whereupon,

13 JEANNE DUFORT,

14 after having been first duly sworn, testified as follows:

15 DIRECT EXAMINATION

16 BY MR. BROWN:

17 **Q.** Ms. Dufort, by whom are you currently employed?

18 **A.** I am self-employed. I'm a realtor.

19 **Q.** And briefly what is your background?

20 **A.** I have a business background in international sourcing and
21 manufacturing and resell. Wholesale supply chain.

22 **Q.** And where are you from?

23 **A.** I live in Madison, Georgia.

24 **Q.** Are you a member of the Coalition for Good Governance?

25 **A.** I am.

1 Q. Now, you're in Morgan County; is that right?

2 A. That is right. It is a beautiful place.

3 Q. And are you involved in any way in elections in Morgan
4 County?

5 A. I am. I am very interested in election integrity. So I
6 regularly attend the board of elections meetings. I have
7 routinely been a poll watcher. For this past June election, I
8 was both a poll watcher, I was a vote review panelist for the
9 democratic party. And I got drafted on election night for
10 three or four hours to open up mail ballots because we had 3000
11 of them, and it took some time.

12 Q. What does the vote review panel do?

13 A. So the vote review panel makes up for the limits of
14 technology. We take ballots that can't be scanned or ballots
15 that have marks that the scanner can't interpret, and we put
16 human eyes on them.

17 So I like to think of us as backstop to make sure that
18 every vote that can where voter intent is clear gets counted.

19 Q. And then how physically or mechanically does the vote
20 review panel make its decisions on votes?

21 A. Under the new system, for this election, we used the
22 adjudication software. So that meant we were reviewing
23 software on a -- we were reviewing ballots on a screen cued up
24 by the software.

25 Q. And in your -- that is what you did for the -- what is

1 it? -- the June election; is that right?

2 **A.** That is right.

3 **Q.** And in your review of the ballots in the adjudication of
4 those ballots, did you notice any anomalies in the way the
5 adjudication software was recording or indicating the results
6 of particular votes?

7 **A.** We did. Of course, it was our first time using the system
8 for all of us. So the whole thing was new. But the system was
9 that a ballot would be cued up that needed review. And if a
10 ballot was considered valid by the system, it was marked
11 highlighted with an overmark of green. If it was considered
12 ambiguous, it was highlighted with an overmark of yellow. And
13 anything that needed our attention, whether it was an overvote
14 or ambiguous, was boxed in with red. And so we were to spend
15 our attention on those. And that is what we were doing.

16 **Q.** In the process of reviewing what had been highlighted by
17 the system in those various colors, did you notice any
18 anomalies?

19 **A.** We did. We came across a ballot that had some green
20 marks, had some yellow marks, and a red box. But it also had
21 some clear voter marks that were not flagged in any way by the
22 software.

23 So I asked the Dominion tech, who was with us -- the vote
24 review panel is bipartisan. It is a democrat, a republican,
25 and somebody from the election board. So the three of us were

1 there with a Dominion rep.

2 And I asked him what about that vote, you know, did it
3 count. And he said, well, of course, it counted. And the rest
4 of us looked at it and said, well, good, because it should
5 count, it is a vote. And we went on, kept going.

6 The second time we found the same situation of a clear
7 vote with no adjudication marks on it at all. No green, no
8 yellow. I asked the tech, can you show me what the system
9 thought about that vote? He said, sure. There is AuditMark.
10 I can show you the AuditMark. That is the record of what is
11 counted for this ballot. And that is where it got interesting.

12 **Q.** What did you do next?

13 **A.** We looked at -- the tech brought up the AuditMark for that
14 particular race. And to all of our surprise, it told us that
15 there wasn't a vote there.

16 **Q.** And did you notice this anomaly on other votes that were
17 within the voter review panel there in Morgan County?

18 **A.** Yeah. As we went through our batch -- I think we had to
19 review about 150 ballots out of the 3000 roughly mail
20 ballots -- we found probably as many as ten different ballots
21 that had -- no, a little more than -- that had votes that
22 hadn't been counted. We said close to 20. We weren't keeping
23 a log. At the time, it was so fresh and so new and, frankly,
24 so shocking that we were just trying to make sure we focused on
25 making sure every vote counted.

1 Q. And did you take any -- did you take photographs of what
2 you were seeing?

3 A. No. That is not allowed.

4 Q. Okay. And have you seen any illustrations that would be
5 helpful for you in describing what you saw?

6 A. Yeah. The New York Times did an article shortly after
7 this came out, and they included an image that they represented
8 as coming from a county, and it looked an awfully lot like what
9 I saw while I was doing that work.

10 Q. Excuse me. Could I have Number 13 up on the screen,
11 please.

12 Is Plaintiffs' Exhibit 13 an illustration that you saw in
13 the New York Times that resembles what you saw?

14 A. It is.

15 Q. Describe for the Court what this shows.

16 A. So the Justice of Supreme Court with Beth Beskin and
17 Charlie Bethel has a red box around it and a yellow highlight
18 over that vote. That is telling us, vote review panel, do your
19 thing, decide if this is a vote.

20 But the race below it was with Hal Moroz and Sarah Warren.
21 It doesn't really have an outline. You have to look carefully
22 to be sure of that, but look to the right. The red box doesn't
23 continue down.

24 So that is an example of a ballot that would have -- or
25 vote that is just not being counted. It is being seen by the

1 system. But the system is saying this is not a vote.

2 **Q.** Now, was this the first that you had heard of this -- when
3 you were doing your vote review panel the first that you had
4 heard of this problem?

5 **A.** Absolutely.

6 **Q.** And then did you subsequent to that hear that from other
7 jurisdictions?

8 **A.** Yes. And I reached out to some of my friends who were on
9 vote review panels for other counties and asked if they had
10 come across this. And, in fact, other counties had also seen
11 it.

12 **Q.** And in skipping ahead --

13 THE COURT: Could you -- so you are saying that this
14 vote for Sarah Warren -- Justin Warren would be recorded as a
15 blank?

16 THE WITNESS: That's right.

17 MR. BROWN: If you could take that exhibit down now
18 off screen share.

19 THE COURT: Are you tendering this?

20 MR. BROWN: Yes, we are tendering that as Exhibit --
21 the premarked number is 13.

22 THE COURT: All right. Just stay with that for now.

23 **Q. (BY MR. BROWN)** Then, Ms. Dufort, have you recently had
24 the opportunity to test precinct scanners supplied by Fulton
25 County?

1 **A.** Yes.

2 MR. BROWN: And, Your Honor, this is -- this is the
3 equipment that was supplied by Fulton County pursuant to your
4 order. I have distributed to the defendants what I'm going to
5 have her identify, which are some photographs of the testing
6 that she conducted.

7 And I am just alerting everybody to this in light of
8 the previous discussion about Dr. Halderman's testimony. Our
9 position is there is nothing even close to confidential or
10 sensitive. But I'm just alerting the parties to that.

11 **Q.** **(BY MR. BROWN)** Ms. Dufort, let me put up on the screen
12 Exhibit 17 if we could.

13 Just while that is happening, let me set this up. You
14 were reviewing -- you had access to a scanner that had been
15 supplied by Fulton County; correct?

16 **A.** Yes.

17 **Q.** What is Exhibit 17?

18 **A.** Exhibit 17 is a hand-marked ballot. We can see three
19 races on the front side, and there were two races on the
20 backside of this ballot.

21 **Q.** Okay. And what does this particular exhibit show?

22 **A.** It shows votes -- five votes for all five races. This
23 particular voter used an X to mark their ballot.

24 **Q.** And is this a test ballot that you used?

25 **A.** It is.

1 Q. I notice it says Anywhere County; right?

2 A. Right.

3 Q. What was -- I don't want to say what was the result that
4 the scanner told you. But what was the scanner's reaction, I
5 guess? What did you see from the scanner when this was used?

6 A. When the scanner saw these marks, it decided that they
7 were not votes and it reported it as a blank ballot.

8 Q. And so -- and this was -- this was a ballot that you fed
9 into the --

10 A. I personally fed it through multiple times because it
11 seemed so surprising.

12 Q. And did you have the opportunity to feed in other ballots
13 to test the effectiveness of the system?

14 A. I did.

15 Q. And I know you have a video of this. But I'm going to
16 show -- did you take a video of that?

17 A. Yes.

18 Q. And did you take that video and then make some still
19 photographs out of that?

20 A. I was the one feeding into the scanner, so I didn't
21 personally shoot the video. But yes.

22 Q. Okay. Let's look at Exhibit 12 --

23 MR. BROWN: We would like to introduce 17 into the
24 record, Your Honor -- Plaintiffs' Exhibit 17.

25 THE COURT: Any objection? Are there any objections?

1 MR. RUSSO: No, Your Honor.

2 THE COURT: And were there any objections to 13?

3 MR. RUSSO: No, Your Honor.

4 THE COURT: Okay. They are both admitted.

5 MR. BROWN: We would like to pull up on the screen
6 Number 12.

7 **Q. (BY MR. BROWN)** And while that is coming up, Ms. Dufort,
8 can you tell the Court what your methodology was in feeding the
9 same ballot in over and over again and why you did it that way?

10 **A.** Sure. The purpose of this was to try as best we could
11 replicate how human beings do things. And that is to say never
12 the same way twice.

13 So we took many of these sample ballots and put them
14 through the scanner in each of the possible ways the voter
15 might see this through, top side up, top first and then bottom
16 first, and bottom side up, top first, and then bottom first to
17 see if it made any difference in how the scanner saw the vote.

18 **Q.** I believe I may have the wrong exhibit number. Can you
19 pull up please the -- the exhibit with the number of different
20 ballots in it? I thought it was 13, 17, or 12. But I must
21 have the wrong number.

22 MR. BROWN: Excuse me, Your Honor, while we do that.

23 **(There was a brief pause in the proceedings.)**

24 **Q. (BY MR. BROWN)** While we're looking for the exhibit that
25 has the number of photographs that you took from the video,

1 could you simply describe narratively for us what you did and
2 what results you received from the scanner.

3 **A.** Sure. So the ballot had five contests on it. Three were
4 races, and two were questions. When I put it through, the
5 first thing I did was put it through each of the four possible
6 ways to feed it. And each time, I got a different message from
7 the scanner. It would return it with an error saying there
8 were ambiguous marks, but it never pointed out the same
9 ambiguous marks.

10 I'm going to look at my notes here in absence of the
11 image. So the first time when we put it in face up like you
12 see first, it told us that one SPLOST race, one of the contests
13 on the backside, was ambiguous.

14 The second time when I put it in bottom first, it told me
15 that the liquor sale vote was what was ambiguous and it didn't
16 tell me anything about the SPLOST.

17 The third time when I turned it over and put it backside
18 facing up top end, it told me the SPLOST and one of the judge
19 races was ambiguous.

20 Then the fourth time when I put it backside bottom in, it
21 told me the SPLOST and the liquor sales was in there. So four
22 different times feeding and four different error messages.

23 The important thing to understand about how this was
24 working -- the precinct scanner is designed to help a voter
25 catch their own mistakes or at least the things that the

1 scanner doesn't understand about their vote. It doesn't tell
2 you affirmatively what it is accepting for a vote. So you will
3 not hear if it is deciding it is a no vote. You will only hear
4 if it thinks it is ambiguous.

5 And it might tell you if the vote cast, but it won't tell
6 you if it counted all five. So I would call that a bit lacking
7 in terms of voter prompts because I may be told I have one race
8 that is ambiguous and I fix that. As a voter, I am going to
9 assume that all of the others were good. But that may not be
10 true, and you are not told by the scanner.

11 **Q.** Ms. Dufort, we now have the exhibit on the screen.

12 **MR. BROWN:** And for the record, this is an exhibit
13 number that I will be told momentarily and put in the record.

14 **Q. (BY MR. BROWN)** But for now, does this show the stills of
15 the video that you took of what you were doing?

16 **A.** It does. And this is the ballot I was describing.

17 **Q.** Okay. And so what you did is you just fed it different
18 ways repeatedly, and you got different results from the scanner
19 almost every time; is that right?

20 **A.** Yes. And there is more.

21 **Q.** Please tell us.

22 **A.** After getting four different results feeding it four
23 different directions, I decided to see if I set it the same
24 direction five straight times would I get the same answer five
25 straight times.

1 Q. What happened?

2 A. I never got the same answer five straight times, no matter
3 which direction I fed it in.

4 Q. Would you expect a computer that is just a computer to
5 give you different results based upon the exact same input five
6 different times?

7 A. I would not. All my life training says reports out of
8 computers are consistent. It is people who aren't. But this
9 is the opposite.

10 MR. BROWN: I do not have any further questions at
11 this time. And we would introduce this exhibit into evidence.

12 MR. RUSSO: I'm sorry. Is it -- Bruce, I'm sorry.
13 Is it just this one page? I think you had originally sent us a
14 compilation of photos.

15 MR. BROWN: It is the compilation I sent you that we
16 would like introduced, and I will perfect the record later.

17 MR. RUSSO: To the extent that they have not been
18 authenticated, because I think they are photos that Ms. Dufort
19 took, we would say that they are not admissible yet. But
20 Mr. Brown can lay that foundation if he needs to.

21 THE COURT: Well, go ahead and do the foundation. I
22 mean, she took -- she has been talking about this very
23 document.

24 MR. RUSSO: And this first page is fine. I think it
25 is a document that has -- it is Page 1 of 27 at the bottom.

1 That is all. I have no objection to this first document.

2 THE COURT: Are you trying to introduce 26 other
3 pages?

4 MR. BROWN: I am, Your Honor.

5 THE COURT: All right. Well, then have her identify
6 what the rest of it is then.

7 MR. BROWN: If we could -- if we could scroll through
8 a couple of seconds at a time each of those pages.

9 THE COURT: Watch out. Somebody is typing while you
10 are speaking.

11 **Q. (BY MR. BROWN)** Ms. Dufort, would you describe what we are
12 doing just generally?

13 **A.** Sure. These first few are just giving you better images
14 of how the voter -- how the vote was marked.

15 **Q.** And this is taken of the test ballots that you ran on the
16 Fulton County machine last week?

17 **A.** That is right. This is one ballot we're looking at. All
18 27 photos are of this ballot and what happened as we put it
19 through the scanner.

20 So this is going through the scanner for the first time,
21 and this is the first result -- the error message that we got,
22 ambiguous for one vote.

23 **Q.** And I believe you testified that error message is supposed
24 to prompt the voter who is feeding the ballot into the scanner
25 to correct something; correct?

1 **A.** That is right. So as a voter, I would look at this and I
2 would probably strengthen my markings around the SPLOST
3 education vote and put it back through.

4 **Q.** If you could keep scrolling will be fine. Thank you.

5 **A.** And that is showing what that mark was. You can see what
6 the voter mark was. Now I am feeding it through bottom -- face
7 up but bottom side. Same ballot.

8 **Q.** And the scanner is supposed to take it any of those four
9 ways; correct?

10 **A.** That is right. All the training in the poll worker
11 training says they can feed it any way. This time, we have a
12 note of an ambiguous mark, but it is the Sunday liquor sales.
13 It is a different contest. And there is that voter mark.

14 Now we flipped it over, and we're feeding the top side of
15 the back in first. I am. This time it sees two ambiguous
16 marks, that SPLOST and now we have added the judge of the
17 probate court.

18 Now I am feeding it backside bottom, SPLOST for education
19 and Sunday liquor sales. Again -- so this is -- you have now
20 gone through four possible ways to feed it, and you have gotten
21 four different ambiguous messages.

22 **Q.** And do the rest of the photos similarly detect different
23 combinations?

24 **A.** That is right. And so we have, you know, 20 different
25 times I put that one ballot through, five times each for each

1 of the possible ways to feed it. And I could never get the
2 same answer between the different ways to feed it, and I could
3 never get five same answers for any one direction.

4 **Q.** And did you sort of deliberately use a checkmark on those?
5 They are checked? You didn't fill in the ovals; is that right?

6 **A.** They are. We tested other types. Voters -- my
7 understanding -- I'm not a lawyer. But my understanding as a
8 vote review person for many years is if voter intent can be
9 discerned you count the vote.

10 **Q.** And that is what you do? Both parties and the third party
11 would count a vote when it is clear what the voter intended?

12 **A.** Yeah. I can't imagine anyone sitting on a vote review
13 panel that would challenge any of these votes except the one on
14 the left of the first page.

15 You don't have it in front of me right now on that side.
16 But that one is marked kind of funny. Right? Right over
17 there, bottom left. That is a funny write-in. So probably my
18 vote review panel would actually have not even known what that
19 vote was for, and we would not have counted that vote. But we
20 would have counted all the others because they were clear.

21 **MR. BROWN:** Thank you very much, Ms. Dufort. I have
22 no further questions. But I would like to go ahead and admit
23 Plaintiffs' Exhibit Number 12.

24 **MR. RUSSO:** No objection.

25 **THE COURT:** It is admitted.

1 MR. RUSSO: Yes, ma'am. No objection.

2 Your Honor, could I proceed?

3 THE COURT: Yes.

4 CROSS-EXAMINATION

5 BY MR. RUSSO:

6 Q. Ms. Dufort, my name is Vincent Russo, and I represent the
7 State defendants in this case. It is a pleasure to meet you
8 over Zoom.

9 A. Thank you.

10 Q. I have a few questions for you quickly. Now, when did you
11 conduct your review of these -- these ballots in Fulton County
12 that you just discussed?

13 A. Tuesday of this week.

14 Q. And where did you conduct that review?

15 A. Downtown Atlanta in a law office.

16 Q. Now, the ballot photos identify a county that is called
17 Anywhere County. How did you obtain those ballots?

18 A. I don't know. I wasn't part of the process of getting the
19 equipment there or getting the ballots. It was done by
20 direction of the Court, and it was outside my purview.

21 Q. Okay. I wasn't sure if this was -- I must have misheard
22 you earlier. I didn't realize this was the Court-ordered
23 inspection. I thought this might be a different one.

24 Now, prior to conducting the test, did you conduct any
25 testing on the scanner?

1 **A.** No.

2 **Q.** And did you check any of the scanner settings?

3 **A.** No.

4 **Q.** Do you know what the scanner settings were at at the time
5 of the test?

6 **A.** No idea.

7 **Q.** Do you have any -- any special education in election
8 systems?

9 **A.** No. I'm a citizen volunteer.

10 **Q.** And you are not being offered as an expert in this -- in
11 this case; right?

12 **A.** I am being offered because I served on a vote review panel
13 and had an experience that was useful.

14 **Q.** And you would agree with me that voters are instructed to
15 fill in the ovals next to the candidate that they are
16 selecting; right?

17 **A.** Yes.

18 **Q.** You have -- at least you state so much in your
19 declaration; correct?

20 **A.** Yes.

21 **Q.** And you would agree with me also that marks that do not
22 register on the scanner is because the ovals that were supposed
23 to be filled in were instead marked with checks in this case?

24 **A.** You are going further than something I can agree with.

25 THE COURT: Mr. Russo, I don't think this is useful.

1 MR. RUSSO: I'll move on, Your Honor.

2 **Q. (BY MR. RUSSO)** The scanners -- now, you are aware of the
3 State Election Board rule that was passed today setting the
4 scanner threshold at 10 percent and a 20 percent threshold?

5 **A.** I was watching this hearing at the time that vote was
6 taken, but I was at that meeting earlier this morning and made
7 remarks to that State Election Board telling them that in my
8 opinion that ten percent threshold will result in votes not
9 being cast. And I believe the report that was proffered for
10 Harri that was marked draft confirms that.

11 **Q.** I'm sorry?

12 **A.** The report that was proffered for Harri to look at, the
13 one that was marked draft that CES did, confirms that seven
14 votes will not be cast as the result of the setting of 10 to
15 20 percent. It is in the report.

16 **Q.** And you believe that the controlled scanner setting should
17 be lower than ten percent?

18 **A.** I believe that a computer should never be allowed to
19 discard a vote without human review. We have a vote review
20 panel process. It works.

21 I think the setting -- whatever setting is necessary to
22 kick these things out to let humans look at them is what works
23 for voters.

24 **Q.** So you would -- you do think it should be a lower
25 threshold than ten percent?

1 **A.** I do.

2 **Q.** And according to your declaration, you state that in the
3 June primary there was about five percent of the ballots that
4 had to be reviewed by the vote review panel?

5 **A.** In my county, yes.

6 **Q.** In your county. And would you agree that a lower scanner
7 threshold setting would require more time and ballots to be
8 reviewed?

9 **A.** Well, there is good news. That same rule that they
10 apparently passed today, according to you, dropped the upper
11 threshold from 35 to 20. And that will result in close to a
12 40 percent reduction, according to that same CES report.

13 So we're going to free up some time on the top end that
14 was wasted and spend some very valuable time making sure every
15 vote gets counted as cast.

16 **Q.** And do you have any idea if the move to an all hand-marked
17 paper ballot system what five percent of the total vote being
18 reviewed would look like?

19 **A.** I haven't done the math. I could do it.

20 MR. RUSSO: Okay. Thanks.

21 No more questions, Your Honor.

22 THE COURT: Let me just ask -- did you have some
23 follow-up, Mr. Brown? I'm sorry. You have the --

24 MR. BROWN: I'm sorry, Your Honor. I don't have any
25 more questions.

EXAMINATION

BY THE COURT:

Q. All right. I just wanted to get some clarity since you had spent a lot of time at the polls at this juncture, more than I have.

When you say when the voter puts the -- this is like for a provisional ballot that would be doing this -- right? -- because --

A. If you were in a precinct, you would not be putting it through the scanner for provisional. If you were in a precinct, you would be putting it through if you were voting under the emergency ballot rule.

Q. Okay. If you were putting it in -- all right.

And when you were adjudicating ballots for Morgan County, were you looking at both? The central office and the precinct level?

A. We do -- the vote review panel winds up looking at all accepted provisional ballots. So some did come in from the precinct level. But we were primarily looking at the mail-in absentee ballots.

THE COURT: And we were talking about the ten percent. I'm going to assume, Mr. Russo, you are not saying that is the same as what Mr. Hursti is saying? I mean, that's a different number. Are we having -- I just want to make sure that we are having clear communication.

1 MR. RUSSO: The ten percent is the threshold under
2 the SEB Rule, Your Honor.

3 THE COURT: Right. But that is different than doing
4 what Mr. Hursti was recommending, which is adjusting the
5 measure -- the DPI level on the scanner -- right? -- unless you
6 are saying something different?

7 MR. TYSON: Your Honor --

8 MR. RUSSO: Yeah. Go ahead, Bryan.

9 MR. TYSON: I think I can clarify this, Your Honor.
10 Bryan Tyson. Mr. Hursti was talking about the dots per inch.
11 This is the percentage of the oval that is filled.

12 THE COURT: Right. So there are two different ways
13 of getting at this issue.

14 **Q. (BY THE COURT)** But with the ten percent, your concern,
15 Ms. Dufort, is that you still will have ballots you don't get
16 to look at?

17 **A.** So here -- you need to think about what are the things
18 that go into that judgment of ten percent -- okay? -- when the
19 scanner is reporting. You have the scanned image. That is
20 what Harri was talking about, the DPI, high quality image.
21 Then you have the software looking and interpreting that image.
22 Okay?

23 But what goes into what the scanner sees depends on a lot
24 of things, including, you know, humidity, including how much
25 of -- how dark the oval mark is. You saw some very light oval

1 marks and some darker oval marks. It matters what color ink
2 you have used.

3 So there are a number of different things that go into
4 that judgment. So I am just here to say very simply I have
5 seen enough votes go uncounted to be very uncomfortable with
6 the very idea. And I have seen a report from the State that
7 affirms that at ten percent votes will not be counted. They
8 will be definitively discounted and not even shown to vote
9 review panel people. And I think that is crazy.

10 THE COURT: All right.

11 MR. BROWN: Your Honor, I have a follow-up questions
12 about emergency ballots and provisional ballots, if I might.

13 THE COURT: Okay.

14 REDIRECT EXAMINATION

15 BY MR. BROWN:

16 **Q.** Ms. Dufort, are you familiar with all of the precinct
17 scanner -- what you were looking at were not black ovals that
18 would have been put in by -- with a black ballot pen --
19 correct? -- the ones that you were testing?

20 **A.** That is right.

21 **Q.** And so the test that you were doing was designed to
22 determine how generally one of these scanners might read
23 mail-in ballots; correct?

24 **A.** That is right.

25 **Q.** And might it be different for -- like, say, the switch was

1 made to hand-marked paper ballots, for example. What would
2 based upon your observations you expect the scanner to behave
3 or not behave with respect to those kinds of ballots?

4 **A.** Well, Harri, who spoke earlier, is the most knowledgeable
5 person I personally know about scanners. But I have also
6 reviewed some of the Dominion manuals that we have acquired
7 through Open Records.

8 And it appears to be true that there is a best practices
9 in the world of what pen you should use to mark ballots. You
10 can't control that with ballots marked from home. But you
11 certainly can control it in a precinct.

12 MR. BROWN: Thank you very much.

13 THE COURT: Thank you. Are there any -- did we take
14 care of all the exhibits, Mr. Brown?

15 MR. BROWN: Yes. We would make sure. It is 12, 13,
16 17. I think they are all admitted.

17 THE COURT: All right. Very good.

18 All right. Well, my suggestion at this point is that
19 counsel look at those -- be given an opportunity to look at the
20 movie that we -- the five-minute movie and we adjourn the
21 public proceeding and that we at least discuss the movie and
22 how we are proceeding for tomorrow. All right?

23 And we're going to adjourn the public portion of
24 this, and I think we'll just -- we'll take care of that
25 business and how we're going to handle tomorrow so that we are

1 proceeding tomorrow.

2 MR. RUSSO: Your Honor, could we take a quick
3 five-minute restroom break?

4 THE COURT: Absolutely. It is 6:08. We're going to
5 call it 6:10.

6 Shall we resume at 6:25? Will that --

7 MR. RUSSO: That is plenty of time for me.

8 THE COURT: Right. Holly, you have the movie?

9 LAW CLERK COLE: I do. And I have forwarded it to
10 you as well.

11 THE COURT: Okay. All right.

12 MR. CROSS: Your Honor, just to clarify, we're going
13 to come back in here? We're not going on a phone call?

14 THE COURT: Well, we can -- you know, we can go
15 back -- let's go back on a phone call. We can always go back
16 on this, and you can look at something together.

17 I don't really want to be on a space that I can't
18 assure right now the privacy of.

19 MR. CROSS: All right. Very good.

20 THE COURT: So we'll go back on the telephone at
21 6:25. Thank you, everybody.

22 **(A brief break was taken at 6:09 P.M., and the**
23 **parties resumed with a telephone conference, as**
24 **follows:)**

25 COURTROOM DEPUTY CLERK: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

THE COURT:

MR. CROSS:

THE COURT:

MR. CROSS:

THE COURT:

MR. TYSON:

THE COURT:

MR. BROWN:

THE COURT:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

MR. MILLER:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

MR. MILLER:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

LAW CLERK COLE: [REDACTED]

THE COURT: [REDACTED]

LAW CLERK COLE: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. MILLER:

THE COURT:

MR. BROWN:

MR. MILLER:

THE COURT:

MR. CROSS:

THE COURT:

MR. CROSS:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. MILLER:

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

MR. BROWN:

[REDACTED]

MR. CROSS:

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

LAW CLERK COLE:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

MR. CROSS:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
MR. CROSS: [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. CROSS:

DR. HALDERMAN:

THE COURT:

LAW CLERK COLE:

MR. CROSS:

LAW CLERK COLE:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

COURTROOM DEPUTY CLERK: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

LAW CLERK COLE: [REDACTED]

COURTROOM DEPUTY CLERK: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. MILLER: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. MILLER: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]
COURT REPORTER: [REDACTED]

THE COURT: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

THE COURT: [REDACTED]
[REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

MR. McGUIRE: [REDACTED]
[REDACTED]
[REDACTED]

THE COURT: [REDACTED]

MR. McGUIRE: [REDACTED]
[REDACTED]

THE COURT: [REDACTED]
[REDACTED]

MR. McGUIRE: [REDACTED]
[REDACTED]
[REDACTED]

MR. TYSON: [REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

MR. McGUIRE: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

MR. CROSS: [REDACTED]

MR. BROWN: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

[REDACTED]

COURTROOM DEPUTY CLERK: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

COURTROOM DEPUTY CLERK: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. MILLER: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

COURTROOM DEPUTY CLERK: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

(The proceedings were thereby adjourned at 6:54
P.M.)

C E R T I F I C A T E

UNITED STATES OF AMERICA

NORTHERN DISTRICT OF GEORGIA

I, SHANNON R. WELCH, RMR, CRR, Official Court Reporter of the United States District Court, for the Northern District of Georgia, Atlanta Division, do hereby certify that the foregoing 208 pages constitute a true transcript of proceedings had before the said Court, held in the City of Atlanta, Georgia, in the matter therein stated.

In testimony whereof, I hereunto set my hand on this, the 12th day of September, 2020.

Shannon R. Welch

SHANNON R. WELCH, RMR, CRR
OFFICIAL COURT REPORTER
UNITED STATES DISTRICT COURT

UNITED STATES DISTRICT COURT
OFFICIAL CERTIFIED TRANSCRIPT